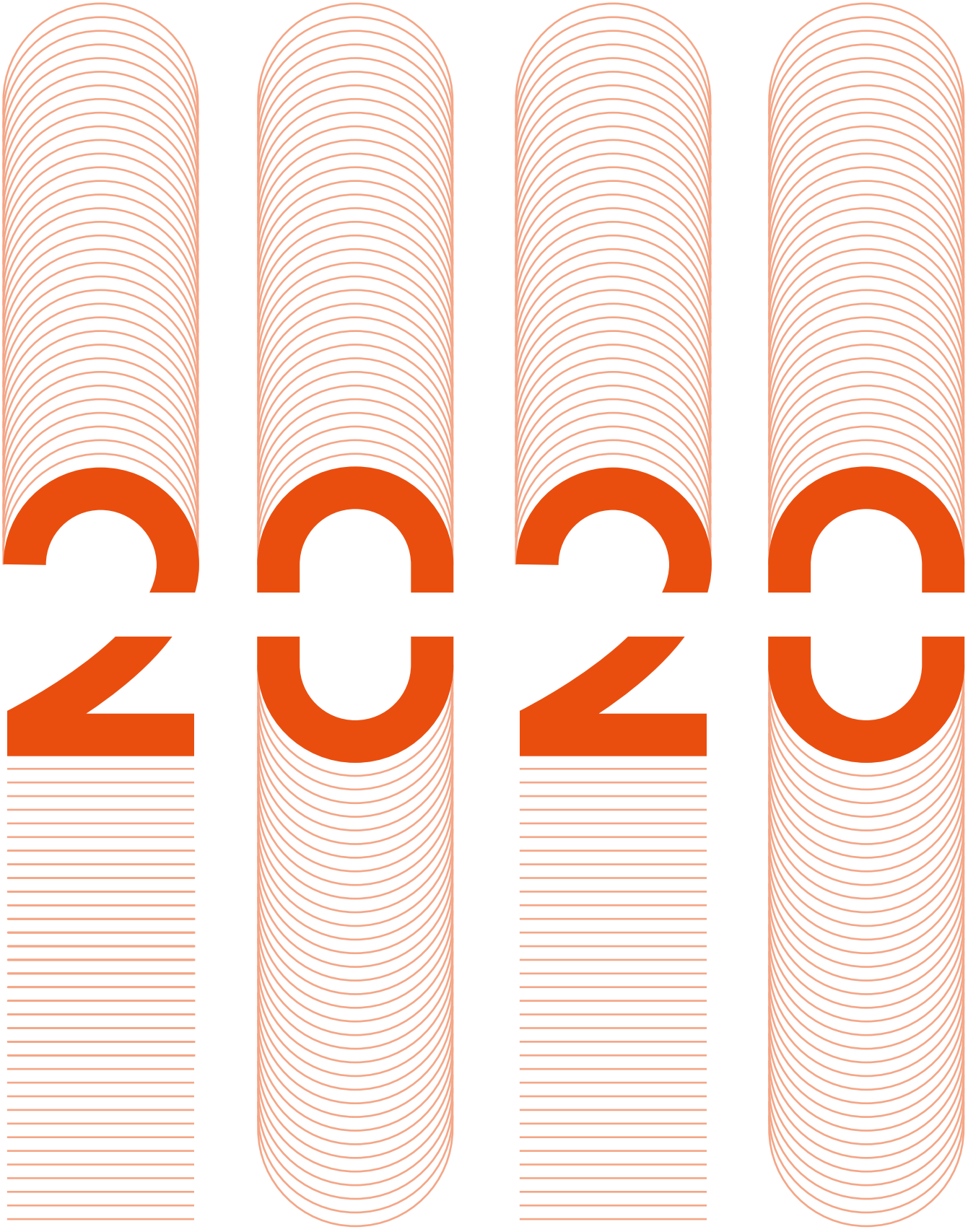


simula

Annual Report 2020

Contents

Were we prepared?

Managing Director's report

In the preface to last year's annual report, I wrote about digitization and I concluded that Simula was well prepared to participate in the transformation currently underway both in science and society. Well prepared! Little did I know that Simula would be put to the test only months later. On March 12, 2020, Norway closed down due to the Covid-19 pandemic that was sweeping across the world and that the world is still fighting today. Days later, a breath-taking development process started at Simula to create a digital solution for contact tracing. After just five weeks, the prime minister launched the solution and 1.5 million Norwegians downloaded the Smittestopp app. The app worked and generated interesting data, but came under harsh criticism for being weak on privacy. Eventually, the privacy concerns were too great in comparison to the utility it provided, and the app was shut down in June 2020. At that point, this was difficult to disagree with; there were almost no new infections in Norway and traditional contact tracing worked well.

But were we prepared? Absolutely not. We were not prepared for the intense criticism that was directed at Smittestopp, nor the overwhelming demand to develop a different solution that we knew would not work. We were unprepared for the harassment and threats targeting our employees. We were not prepared for our solution to be attacked by Amnesty International. Our response that central data storage was necessary to achieve sufficient accuracy was drowned in an opposition that was frighteningly unison, the scientific basis of which was challenging to understand. The argument that the right to life and the right to privacy must be balanced against one another received little attention in a debate completely dominated by privacy considerations.

We were completely unprepared for all this.

When it comes to the technological part of the Smittestopp development, it turned out that we were quite prepared. We were prepared because the Government has funded an extensive research activity at Simula; brilliant researchers have built up the right expertise in networks and software. Together with skilled partners, the development of Smittestopp went quickly and without too much difficulty. So, we were technologically prepared, but the debate took us by surprise.

Have we learned, and are we prepared now? We have evaluated and tried to understand. Some conditions need to be rectified and improved. Still, I doubt we will be ready for a new round of a project on such a scale. Technologically yes, but everything that comes along with it we will struggle with. Simula is first and foremost a research institution and will continue to be just that. Nevertheless, we convey to those who finance us that our expertise will always be at their disposal if a crisis requires so. We will stick to that, even though we will be unprepared for everything peripheral to the purely technical challenges the next time around.

Was it wrong to offer our expertise? Many probably think it was - both inside and outside of Simula. For me, it is simply unthinkable not to offer our expertise when the situation deems it necessary. I have seen that companies decided not to submit a tender for Smittestopp 2.0 because of the risk to their reputation. Yes, there is a danger of losing prestige. We have evaluated this, and our reputation did suffer with some. Yet, that will not prevent us from doing it again—a hundred times over, if the situation requires it. Simula is owned and financed by the Government. In return, the Government should be able to ask us for assistance when there is a crisis.

Apart from the work with Smittestopp, Simula experienced 2020 much like everyone else. The burden on the individual employee has been heavy, and it has not been easy to be new at Simula this year. However, the production itself went amazingly well - articles were written, candidates defended their dissertations, and we invested in new start-up companies. For 2021, we hope, like everyone else, for good times where we can meet again and think, talk and write together.

Photo: Professor Aslak Tveito, Managing Director

Report of the Board of Directors 2020

Simula's mission is to conduct fundamental long-term research in selected aspects of information and communication technologies, thereby contributing to lasting innovation in the business sector.

From left: Aslak Tveito (Managing Director), Petter Nielsen, Hilde Brunvand Nordvik, W. Simon Funke, Mats Lundqvist, Ingvild Myhre (Chairman of the Board), Katharina Ringen Asting, Pinar Heggernes, Ingolf Søreide. **Absent:** Elin Backe Christophersen (Photo taken in 2019)

Now in its 19th year of operations, Simula Research Laboratory AS (SRL) and the Simula Group achieved a turnover of NOK 155 million and NOK 256 million respectively in 2020, and a net result of NOK 10.1 million and NOK 21.2 million.

Administration and organisation

SRL is registered as a limited company under 100% ownership of the Norwegian Ministry of Education and Research. The company combines academic traditions with recognised business management models. SRL is the parent company with five subsidiaries. Simula Innovation AS (SI) is wholly owned and manages SRL's investment portfolio, including shares in the subsidiary Simula Consulting AS. Simula School of Research and Innovation AS (SSRI) is owned jointly by SRL (72%), Equinor (14%), the Municipality of Bærum (9%), and Telenor (5%). Simula UiB AS is owned by SRL (51%) and the University of Bergen (49%). Simula Metropolitan Center for Digital Engineering AS (SimulaMet) is owned by SRL (51%) and Oslo Metropolitan University (49%). Simula Consulting, established on January 1st 2020, is owned by Simula Innovation (100%).

The parent company and its subsidiaries cooperate closely. All are based in Bærum, except for Simula UiB, located in Bergen and SimulaMet, situated in Oslo's Bislett neighbourhood.

Activities

Simula conducts basic and long-term research in networks and communication systems, scientific computing, software engineering, machine intelligence, and cybersecurity. The research focuses on core challenges that combine technological development with utility value for industry, business, and society.

The activities in 2020 were strongly affected by the Covid-19 pandemic in various ways. A relatively large group of employees spent considerable time from March well into the autumn, working on the app "Smittestopp" for the National Institute of Public Health. This work challenged Simula as an organisation, as a knowledge provider and as a solutions provider.

At the same time, everyone at Simula was affected when international research collaboration was reduced or stopped. As a result of a long-term travel ban, the researchers and research fellows participated in fewer conferences and stays abroad than planned, resulting in somewhat fewer publications in 2020, especially conference articles. Similarly, it was more challenging to recruit new employees for projects, causing delays in some projects. Overall, however, Simula's work with research, education and innovation has suffered significantly less than what might have been feared. Production has generally remained at a high level also in 2020.

Simula's research is published in international scientific journals and by leading scientific and technical publishing companies. In 2020, Simula's research featured in 89 articles in international journals, one book, two chapters in books and 82 peer-reviewed conference proceedings.

Throughout 2020, Simula's scientific employees supervised eight doctoral candidates and 24 master's students to complete their degrees successfully. From 2001 to the end of 2020, a total of 141 doctoral candidates and 476 master's students have been supervised at Simula. In addition, over the summer of 2020, 19 summer interns were hired to work on various short-term projects.

The University of Oslo, which is an important partner, granted the majority of these degrees. Degrees have also been awarded by the University of Bergen, the Technical University of Denmark, the University of Oxford (UK) and Chalmers University of Technology (Sweden).

Personnel and Health, Safety & Environment

At the end of 2020, the Simula Group had 184 employees, with 159 in full-time positions and 25 working in part-time positions. Of these, 124 were men, and 60 were women comprising 85 Norwegians and 99 foreign nationals. Eighty people were employed as research fellows, with 33 postdoctoral positions and 47 PhD students. In addition, there were 30 external PhD students under the supervision of Simula researchers.

SRL had 64 employees at the end of the year, with 52 engaged in full-time positions and 12 in part-time positions. Of these, 40 were men and 24 women.

Simula aims to maintain its strong focus on HSE. Absence due to illness was 1,9% for the Group and 0,8% for SRL in 2020. The Group will work actively to keep sick leave at continued low levels. There were no reports of occupational diseases or accidents during the year. HSE incidents are reported at each board meeting.

The Covid-19 pandemic brought completely new challenges for the work with HR and HSE for Simula. Simula was early to facilitate home office for the employees and the administration ensured that the necessary equipment was transported home to employees including support for electronic infrastructure and necessary furniture. HR introduced routines to follow up with the individual employees, especially new employees with a limited social network in Norway. Some employees report that they find the work situation challenging. Simula tries to facilitate as much as possible to meet individual needs. Significant efforts have also been made to continuously inform employees about both national guidelines and Simula's adaptation to these. In order to adapt to the new work situation, it has been necessary to find new ways of interacting. For example, the traditional "Cake Thursday" has been made digital, to great success.

HSE-related incidents are reported at each board meeting, including regular updates on employee welfare, employee surveys and implemented measures in response to the pandemic. Although no significant adverse effects on HSE have been detected due to the pandemic, it cannot be ruled out that effects may occur in the longer term.

Simula's business activities do not pollute the external environment beyond what is expected from a typical office business.

Equal Opportunities and Integration

The Group works to promote the purpose of the Discrimination Act by promoting gender equality, ensuring equal opportunities and rights and preventing discrimination in the business. Beginning from the financial year 2020, Norwegian employers and public authorities have a duty to work with equality and non-discrimination and account for this work and report the actual situation. The report can be found under the section «Gender equality report, social responsibility and working environment».

The Simula Group represents 39 different nations, and 54% of the Group's employees come from countries outside Norway. Simula offers Norwegian courses, social events, and support related to visas, taxes, housing, and other administrative matters.

The boards of SRL and SSRI had adopted an action plan to increase the proportion of female employees in scientific positions to 30% by 2017. By the end of 2020, the proportion of female scientific researchers, meaning the average of PhD students, postdoctoral fellows and researchers in permanent positions, was 28%. The proportion of female researchers in permanent positions was 19%, and among PhD students and postdoctoral fellows, the portion was 23% and 42%, respectively. Simula's strategy for the period 2018–2028 aims to achieve a 40% share of women in the Simula Group (at the end of 2020, this share of women was 33%).

Simula will continue to work actively to improve gender balance in the Group through targeted planning. To achieve the goal of 40% female employees by 2028, Simula will continue to focus on measures for recruiting new, talented female candidates and the development and adaptation of work situations for qualified women who Simula already employs.

Financial Risk

Simula is exposed to a certain amount of financial risk in connection with the Group's equity investments. The value of the shares portfolio is assessed continually; if there is a considerable risk connected to the value of assets, a write down is performed. There is also some currency risk related to EU projects in which Simula participates. In total, the Board nonetheless considers the financial risk as low. Credit risk and liquidity risk are also low. The Board concludes that risks to the organisation are generally low.

Financial Performance

The Group had a turnover of NOK 256 million in 2020, an increase of 9% from the previous year. Operating results were NOK 12.2 million, with a net result of NOK 21.2 million. Financial income is mainly related to revenues after the sale of shares.

SRL AS had total revenue of NOK 155 million in 2020. External project funding totalled NOK 96.2 million. Net profit for the year was NOK 10.1 million, which was transferred to other equity. Equity in SRL constitutes NOK 73.1 million, corresponding to an equity ratio of 49% of total assets.

Simula School of Research and Innovation AS (SSRI) had a total operating revenue of NOK 35 million in 2020, with a net profit after tax of NOK 0.9 million.

Simula Innovation AS (SI) had a total operating revenue of NOK 2.3 million, total financial items were NOK 5.6 million, with a net profit after tax of NOK 2.8 million in 2020.

The total operating revenue of Simula UiB AS was NOK 33.4 million in 2020, with a net profit after tax of NOK 1.3 million.

The 2020 operating revenue of Simula Metropolitan Center for Digital Engineering AS (SimulaMet) was NOK 72.2 million, with a net profit after tax of NOK 6.8 million.

Simula Consulting AS's operating revenues were NOK 3.1 million, and the annual result was a loss of NOK 0.8 million in 2020.

Future Development

The Board believes that our annual accounts provide a correct picture of SRL AS and the Group. The Group is in a healthy economic and financial position.

At the end of 2020, Simula was participating in 12 projects funded by the EU.

In accordance with section 3, paragraph 3a, of the Norwegian Accounting Act, conditions for continuing operations are confirmed present, and the annual accounts are prepared accordingly.

The Work of the Board of Directors

Simula's Board had five meetings and one seminar in 2020. The Board would like to thank all employees for their strong contribution throughout the year.

Fornebu, 3 March 2021

Company overview 2020

Simula is led by managing director Professor Aslak Tveito and today comprises six companies spread over three locations in Norway. Since Simula Research Laboratory AS (SRL) was established in 2001, various daughter companies have been established under SRL to organize its expanding activities in research, education and innovation. These companies are summarized below.

Simula Research Laboratory (SRL) AS

Deputy Managing Director:	Kyrre Lekve
Location:	Fornebu
Ownership:	100% Norwegian Ministry of Education and Research

The six departments of the mother company primarily perform research and educate graduate students within the ICT fields of software engineering and scientific computing. Specific innovation activities, including the Simula Garages at both Fornebu and downtown Oslo, are also managed by SRL.

Research Directors: Are Magnus Bruaset and W. Simon Funke

Research Departments:

- Dept. of Computational Physiology (ComPhy) – Dept. Head: Hermenegild Arevalo
- Data-Driven Software Engineering Dept. (DataSED) – Dept. Head: Leon Moonen
- Dept. of Engineering Complex Software Systems (ComplexSE) – Dept. Head: Shaukat Ali
- Dept. of High-Performance Computing (HPC) – Dept. Head: Xing Cai
- Dept. of Numerical Analysis & Scientific Computing (SCAN) – Dept. Head: Benjamin Ragan-Kelley
- Dept. of Validation Intelligence for Autonomous Software Systems (VIAS) – Dept. Head: Arnaud Gotlieb

Simula UiB AS

Director:	Kjell Jørgen Hole
Location:	Bergen
Ownership:	51% Simula Research Laboratory, 49% University of Bergen (UiB)

Simula UiB specializes in cybersecurity, conducts research and educates graduate students within cryptography and information theory. Simula UiB is based at the Department of Informatics at UiB.

Research Director: Øyvind Ytrehus

Research Sections:

- Cryptography Section – Section Head: Håvard Raddum
- Information Theory Section – Section Head: Eirik Rosnes

Simula Metropolitan Center for Digital Engineering (SimulaMet) AS

Director:	Olav Lysne
Deputy director:	Marianne Sundet
Location:	Oslo
Ownership:	51% Simula Research Laboratory, 49% Oslo Metropolitan University

SimulaMet opened in 2018 and is responsible for Simula's research activities in networks and communications, machine learning and IT management. In addition to performing research, SimulaMet also educates and supervises PhD and Master's students at OsloMet and contributes to innovation in society through collaboration projects, startup-companies and licensing of research results. SimulaMet is located at Oslo Metropolitan University.

Research Director: Sven-Arne Reinemo

Research Departments:

- IT Management – Dept. Head: Magne Jørgensen
- Mobile Systems and Analytics (MOSAIC) – Dept. Head: Özgü Alay
- Machine Intelligence Department (MIND) – Dept. Head: Evrim Ataman
- Center for Resilient Networks & Applications (CRNA) – Center leader: Ahmed Elmokashfi
- Holistic Systems Department (HOST) – Dept. Head: Pål Halvorsen
- EDOS - Effektiv Digitalisering av Offentlig Sektor – Center head: Magne Jørgensen

Simula School of Research and Innovation (SSRI) AS

Director:	Marianne Aasen
Location:	Fornebu
Ownership:	72% Simula Research Laboratory, 14% Equinor, 9% Bærum Municipality, 5% Telenor

SSRI educates tomorrow's ICT researchers and specialists at both Master's and PhD levels in collaboration with domestic and international academic institutions. SSRI also performs outreach and educational activities for both students and teachers in Bærum and Oslo.

Simula Innovation (SI) AS

Director:	Ottar Hovind
Location:	Fornebu
Ownership:	100% Simula Research Laboratory

This is where research meets society's practical demands – SI manages Simula's investment portfolio and supports entrepreneurs from the start-up phase.

Simula Consulting (SC)

Director:	Valeriya Naumova
Location:	Fornebu
Ownership:	100% Simula Innovation

Simula Consulting provides high-quality R&D consulting services in the core competence areas of Simula.

Income statement

SRL				SIMULA GROUP	
2019	2020		Note	2020	2019
		OPERATING REVENUES			
149 595 621	155 117 747	Operating revenues	6	256 397 982	235 852 111
149 595 621	**155 117 747**	**Total operating revenues**		**256 397 982**	**235 852 111**
		OPERATING EXPENSES			
78 655 719	80 316 277	Salary and social costs	5	156 659 866	138 933 858
2 307 440	1 831 502	Depreciation	3	3 090 536	2 679 042
71 760 854	65 580 083	Other operating expenses		84 481 096	89 040 843
152 724 013	**147 727 862**	**TOTAL OPERATING EXPENSES**		**244 231**	**499 230 653 743**
-3 128 392	**7 389 885**	**OPERATING PROFIT**		**12 166 483**	**5 198 368**
		FINANCIAL ITEMS			
164 999	57 297	Other interest income		308 485	387 759
14 112 635	2 989 911	Other financial income		15 413 086	38 565 391
0	0	Write-down of shares	12	6 025 017	1 668 420
20 868	44 153	Other interest expenses		77 056	44 404
190 667	194 639	Other financial expenses		311 631	242 847
14 066 100	**2 808 415**	**NET FINANCIAL ITEMS**		**9 307 867**	**36 997 479**
10 937 708	**10 198 301**	**PROFIT BEFORE TAX**		**21 474 350**	**42 195 847**
0	63 863	Tax	13	262 294	74 604
10 937 708	10 134 438	**NET PROFIT**		21 212 056	42 121 243
0	0	Minority interest		4 231 920	5 820 960
10 937 708	10 134 438	Profit after minority interest		16 980 136	36 300 283
		ALLOCATION OF THE YEAR'S NET PROFIT			
10 937 708	10 134 438	Transferred to other equity			
10 937 708	**10 134 438**	**TOTAL ALLOCATED**			

Balance sheet– assets

SRL				SIMULA GROUP	
2019	2020		Note	2020	2019
		ASSETS			
		FIXED ASSETS			
0	166 237	Deffered tax assets		166 237	0
0	**166 237**	**Total intangible assets**		**166 237**	**0**
		TANGIBLE FIXED ASSETS			
2 061 185	229 683	Furniture, fixtures, equipment	3	3 748 130	3 424 440
2 061 185	**229 683**	**Total tangible fixed assets**		**3 748 130**	**3 424 440**
		FINANCIAL FIXED ASSETS			
35 097 351	36 805 583	Investments in subsidiaries	10	1 316 075	3 423 650
0	0	Loans to group companies		2 798 629	3 430 616
0	0	Investments in shares	12	48 196 020	42 799 289
0	0	Other receivables		2 000 000	3 000 000
35 097 351	**36 805 583**	**Total financial fixed assets**		**54 310 724**	**52 653 555**
37 158 536	**37 201 503**	**TOTAL FIXED ASSETS**		**58 225 091**	**56 077 995**
		CURRENT ASSETS			
		RECEIVABLES			
15 775 405	6 338 519	Account receivables		15 546 730	24 129 521
31 536 422	13 965 834	Other receivables		28 312 838	29 239 001
47 311 828	**20 304 353**	**TOTAL RECEIVABLES**		**43 859 568**	**53 368 522**
		INVESTMENTS			
19 792 989	21 607 402	Market-based funds		21 607 402	19 792 989
0	0	Market-based bonds		51 347 397	0
19 792 989	**21 607 402**	**Total investments**		**72 954 799**	**19 792 989**
21 529 496	**39 086 043**	**Bank deposits**	9	**77 149 855**	**92 411 563**
88 634 313	**80 997 798**	**TOTAL CURRENT ASSETS**		**193 964 222**	**165 573 073**
125 792 849	**118 199 301**	**TOTAL ASSETS**		**252 189 313**	**221 651 068**

Balance sheet - equity and liabilities

SRL 2019	SRL 2020		Note	SIMULA GROUP 2020	SIMULA GROUP 2019
		EQUITY AND LIABILITIES			
		EQUITY			
		PAID-IN EQUITY			
1 200 000	1 200 000	Share capital	7,8	1 200 000	1 200 000
1 200 000	1 200 000	TOTAL PAID-IN EQUITY		1 200 000	1 200 000
		RETAINED EARNINGS			
61 786 071	71 920 509	Other equity	8	125 141 784	107 936 950
0	0	Minority interests	8	23 294 682 1	9 062 762
61 786 071	71 920 509	TOTAL RETAINED EQUITY		148 436 466	126 999 712
62 986 071	**73 120 509**	**TOTAL EQUITY**		**149 636 466**	**128 199 712**
		LIABILITIES			
		OTHER LONG TERM DEBT			
0	0	Other long term debt	15	14 000 000	14 000 000
0	0	TOTAL LONG TERM DEBT		14 000 000	14 000 000
		CURRENT LIABILITIES			
28 361 723	11 556 322	Accounts payable		20 842 812	17 547 455
0	0	Tax payable	13	198 431	74 604
3 866 213	4 287 044	Public duties payable		11 575 167	9 771 640
30 578 842	29 235 428	Other current liabilities		55 936 437	52 057 657
62 806 778	45 078 793	TOTAL CURRENT LIABILITIES		88 552 847	79 451 356
62 806 778	**45 078 793**	**TOTAL LIABILITIES**		**102 552 847**	**93 451 356**
125 792 849	**118 199 301**	**TOTAL EQUITY AND LIABILITIES**		**252 189 313**	**221 651 068**

FORNEBU, 31.12.2020 / 03.03.2021 The Board of Directors

Ingvild R. Myhre Chair of the Board	Mats A. Lundqvist Board member	Ingolf Søreide Board member	Katharina R. Asting Board member	W. Simon Funke Board member
Aslak Tveito Managing Director	Pinar Heggernes Board member	Hilde B. Nordvik Board member	Petter Nielsen Board member	Elin B. Christophersen Board member

Notes to the financial statements

Note 1 Accounting principles

The financial statement has been prepared in accordance with the regulations of the Norwegian Accounting Act of 1998 and generally accepted accounting principles.

General rule for valuation and classification of assets and liabilities

Assets intended for permanent ownership or long-term use have been classified as fixed assets. Other assets have been classified as current assets. Receivables to be repaid within one year are classified as current assets. Similar criteria have been applied to the classification of current and long-term liabilities.

Fixed assets are valued at acquisition cost but written down to fair value for any impairments that are not expected to be temporary. Fixed assets with a limited economic life are depreciated over the useful life of the asset. Long-term liabilities are recognised at nominal value in the balance sheet on the date they are incurred. Long-term liabilities are not revalued to fair value as a result of changes in interest rates.

Current assets are valued at the lower of cost and fair value. Current liabilities are recognised at nominal value in the balance sheet on the date they are incurred. Current liabilities are not appreciated to fair value as a result of changes in interest rates.

Certain items are valued according to other principles, as explained below.

Foreign Currency transactions

Assets and liabilities in foreign currency are translated into Norwegian kroner at the mid-rates quoted by Norway's National Bank on the balance sheet reporting day.

Tangible fixed assets

Tangible fixed assets are depreciated over the expected useful life of the asset. Depreciation is generally performed in a straight line over the expected useful life of the asset.

Receivables

Accounts receivables and other receivables are recognised at nominal value less provisions for anticipated losses from bad debt. Provisions for losses are based on an individual assessment of each receivable. In addition, if necessary, a general provision is made to cover expected losses on other receivables.

Tax

The company has not recognised tax expenses in the parent company's financial statements, since the operation is not considered to be liable for taxation.

Revenue recognition

Revenues are recognised when delivery has taken place.

The Group

The consolidated financial statement comprises the parent company Simula Research Laboratory AS (SRL) and the subsidiaries Simula School of Research and Innovation (SSRI), Simula Innovation (SI), Simula Metropolitan Center for Digital Engineering AS (SimulaMet), Simula Consulting AS and Simula UiB. Simula Research Incorporated is owned with 100% but is not included in the consolidated financial statements. The consolidated financial statements are prepared as if the Group were one economic entity. Transactions and balances between group companies are eliminated.

Note 2 Financial market risk and currency risk

The company is, to a certain extent, exposed to financial market risks by investing in start-up companies. The currency risk the company is exposed to is mainly due to EU-funded research and the collaboration with universities in the United States.

Note 3 Fixed assets

SRL			
Fixed assets	**Computer equipment**	**Furnishings, equipment, etc.**	**Total fixed assets**
Acquisition costs as of 01.01	3 560 169	19 143 932	22 704 101
Additions	-	-	-
Disposals	2 897 357	4 525 744	7 423 101
ACQUISITION COST AS OF 31.12	**662 812**	**14 618 188**	**15 281 000**
Culmulative depreciation as of 31.12	-2 819 659	-19 092 453	-21 912 112
Disposals	2 357 522	4 503 273	6 860 795
BOOK VALUE AS OF 31.12	**200 675**	**29 008**	**229 683**
Year's depreciation	542 568	1 288 934	1 831 502

SIMULA GROUP			
Fixed assets	**Computer equipment**	**Furnishings, equipment, etc.**	**Total fixed assets**
Acquisition costs as of 01.01	5 785 117	19 777 006	25 562 123
Additions	86 575	3 367 841	3 454 416
Disposals	2 937 545	4 525 744	7 463 289
ACQUISITION COST AS OF 31.12	**2 934 147**	**18 619 103**	**21 553 250**
Culmulative depreciation as of 31.12	-4 437 625	-20 228 290	-24 665 915
Disposals	2 357 522	4 503 273	6 860 795
BOOK VALUE AS OF 31.12	**854 044**	**2 894 086**	**3 748 130**
Year's depreciation	1 140 344	1 950 192	3 090 536

The economic life of operating assets is calculated as:
*Computer equipment 2-5 years
*Furnishings, fixtures and equipment 3-5 years

Note 4 Pensions

The Group has a duty to maintain an occupational pension scheme in accordance with the Mandatory Occupational Pension Schemes Act. The company's pension schemes fulfil the requirements of this legislation. The Group has a pension scheme which covers all employees. The scheme entitles members to defined future benefits. These are primarily dependent on the number of years of pension accrual, salary level at retirement and the size of the pension benefits received from the Norwegian National Insurance Scheme. The occupational pension scheme is financed through the build-up of funds in the Norwegian Public Service Pension Fund.

Note 5 Payroll costs, number of employees, remunerations, employee loans and auditor's fees

	SRL		SIMULA GROUP	
Salary and social costs	**2020**	**2019**	**2020**	**2019**
Salary	49 096 424	45 214 963	122 204 226	106 223 963
Social security	6 867 186	6 887 419	17 616 052	16 296 528
Pension costs	5 833 100	5 624 117	12 685 562	11 221 651
Other benefits	2 543 277	3 553 967	4 154 026	5 191 716
Personnel costs re-invoiced group	15 976 290	17 375 253	-	-
TOTAL	**80 316 277**	**78 655 719**	**156 659 866**	**138 933 858**
Number of full-time equivalents	55	55	156	145

Remuneration paid to senior company officers	**Managing Director**	**Board of Directors**
Salary	2 895 511	612 450
Pension expenses	122 835	-
Other remuneration	123 713	-
TOTAL REMUNERATION	**3 142 059**	**612 450**

No loans have been granted to, nor any guarantees made on behalf of, the Managing Director, the Board Chair or any other related parties. No loans or guarantees account for more than 5% of the company's share capital.

Auditor

The auditor's fees break down as follows:

Parent company:		**Subsidiaries:**	
Statutory auditing services	116 800	Statutory auditing services	159 300
Other services	77 600	Other services	48 200
Total auditor's fees	194 400	Total auditor's fees	207 500

The auditor's fee is stated exclusive of VAT.

Note 6 Operating revenue

	SRL		SIMULA GROUP	
	2020	2019	2020	2019
Research funding	56 580 000	55 973 000	71 805 000	70 973 000
Subsidies from the Research Council of Norway, EU, etc.	78 778 218	91 367 701	159 946 905	159 493 923
Other income	19 759 529	2 254 920	24 646 077	5 385 188
TOTAL	**155 117 747**	**149 595 621**	**256 397 982**	**235 852 111**

Note 7 Share capital and shareholders

Share capital	Quantity	Face value	Capitalized
Ordinary shares	800	1 500	1 200 000
TOTAL	**800**		**1 200 000**

The company's shareholders as of 31.12	Quanity	Stake
The Norwegian state represented by the Ministry of Education and Research	800	100.0%
TOTAL NO. OF SHARES	**800**	**100.0%**

Note 8 Equity

SRL	Share capital	Other equity	Total
Equity as of 01.01	1 200 000	61 786 071	62 986 071
Profit/loss for the year		10 134 438	10 134 438
EQUITY AS OF 31.12	**1 200 000**	**71 920 509**	**73 120 509**

Simula Group	Share capital	Other equity	Minority interests	Total
Equity as of 01.01	1 200 000	107 936 950	19 062 762	128 199 712
Change in equity as a result of a change in principle	-	224 698	-	224 698
Profit/loss of the year	-	16 980 136	4 231 920	21 212 056
EQUITY AS OF 31.12	**1 200 000**	**125 141 784**	**23 294 682**	**149 636 466**

Note 9 Bank deposits

	SRL	Simula Group
Restricted tax withholdings total:	2 328 084	5 779 793
Restricted bank deposist relating to leasing contracts total:	3 063 323	3 063 323

Note 10 Subsidiaries, associates, etc.

	Acquired	Office	Country	Share
Simula Innovation AS	04/05/2004	Fornebu	Norway	100%
Simula School of Research and Innov. AS	08/05/2007	Fornebu	Norway	72.3%
Simula UiB AS	17/12/2015	Bergen	Norway	51%
Simula Metropolitan CDE AS	21/11/2017	Oslo	Norway	51%
Simula Consulting AS	07/11/2019	Fornebu	Norway	100%

The company has made a net group contribution to SI of NOK 815 807, - which is booked as an increased cost price for the shares.

	Result	Equity 31/12
Simula Innovation AS	2 828, 859	58 755 673
Simula School of Research and Innovation AS	858 782	14 904 772
Simula UiB AS	1 343 838	16 803 567
Simula Metropolitan Center for Digital Engineering AS	6 649 976	22 307 801
Simula Consulting AS	-760 946	2 233 652

Non-consolidated subsidiaries	Cost	Result	Equity 31/12
Simula Research Laboratory Inc., owned 100% av SRL	1 316 075	0	USD 150 000

Note 11 Balances and transactions between group companies and associates

	2020	2019
Receivable from SI AS	0	201 630
Receivable from SSRI AS	218 473	1 177 688
Receivable from Simula Metropolitan CDE AS	275 414	200 422
Receivable from SC AS	320 617	0
Payable to SI AS	1 043 377	5 361 000
Salary costs refunded to SSRI AS	15 738 837	17 261 280
Sale of services, etc to SI AS	650 000	574 049
Sale of services, etc to SSRI AS	3 146 570	4 585 038
Sale of services, etc to Simula UiB AS	1 250 000	700 000
Sale of services, etc to Simula Metropolitan CDE AS	2 739 792	1 298 026
Sale of services, etc to SC AS	685 830	0
Purchases of services, etc from SI AS	2 287 835	2 559 310
Purchases of services, etc from SSRI AS	3 000 000	3 307 200
Purchases of services, etc from Simula Metropolitan CDE AS	19 223 942	13 368 567
Purchases of services, etc to SC AS	856 215	0

Note 12 Securities and shares in other enterprises, etc.

Other share investments	Quantity	Face value per share (NOK)	Shareholding	Cost price
ABCB AS	333	1.00	25.0%	1 498 500
Adline Professional AS	4 101	1.00	5.3%	1 086 929
AlphaEntrance AS	13 400	1.00	6.9%	999 975
Augere Medical AS	16 430	1.00	24.9%	1 058 930
Blueware corp.	334 319	USD 0.0001	1.8%	7 000 000
Celerway Communications AS	15 250	1.00	21.0%	3 009 168
Coupler AS	13 463	1.00	2.9%	1 000 000
Edgefolio UK Limited	11 541	GBP 1.00	8.9%	1 633 454
Entire Body AS	66 666	15.00	5.9%	999 990
EYR Medical AS	20 839	0.30	4.90%	2 033 314
Fabriscale Technologies AS	19 983	1.00	26.6%	4 010 410
Facil AS	13 888	0.30	11.2%	1 299 948
Forzasys AS	33 000	0.34	30.0%	1 528 065
Future Ready AS	1 875	1.00	5.5%	500 000
Imerso AS	891	10.00	10.7%	1 615 925
Insilicomed Inc, USA	131 945	USD 1.80		1 220 755
Investory Onlineplattform GmbH	3,032	EUR 1.00	3.9%	964 340
LeadX AS	6 690 476	0.001	14.2%	2 250 000
Leid AS	6 742	1.00	10%%	1 000 000
MemoScale AS	50 669	1.00	22.8%	2 749 895
N-Abel AS	13 500	1.00	28.2%	1 800 000
Qbee AS	766	1.00	18.2%	2 000 026
Quine AS	5 534	1.00	12.0%	450 017
SmartBob AS	2 040	5.52	15.6%	1 552 118
StalkIt AS	69	1000.00	2.8%	1 001 209
Storeshop AS	43 000	1.75	8.0%	999 750
Testify AS	44 433	1.00	30.0%	1 427 117
Tipio AS	90 498	0.10	7.1%	1 000 000
Truegroups AS	76 923	13.00	0.7%	999 999
Unloc AS	2 505	1.00	3.8%	1 499 754
Volur AS	160	15.00	4.0%	1 000 000
Write-down of shares				14 745 218
TOTAL INVESTMENT IN ASSOCIATES				**36 444 370**

Pre-seed investments on behalf of Innovasjon Norge AS:	Quantity	Face value per share (NOK)	Shareholding	Cost price
Adline Professional AS	2 839	1.00	3.7%	752 534
AlphaEntrance AS	9 999	1.00	5.2%	1 500 000
Entire Body AS	33 334	15.00	2.9%	500 010
EYR Medical AS	6 521	0.30	1.5%	1 499 830
Fabriscale Technologies AS	3 223	1.00	4.3%	1 999 793
Facil AS	2 778	0.30	2.3%	500 000
Future Ready AS	638	1.00	1.4%	250 000
LeadX AS	1 333 333	0.001	3.3%	750 000
Memoscale AS	3 125	1.00	7.8%	1 000 000
SmartBob AS	179	5.52	1.4%	498 515
StalkIt AS	69	1000.00	2.8%	1 001 209
Truegroups AS	76 923	13.00	0.7%	999 999
Unloc AS	630	1.00	1.0%	499 760
TOTAL PRE-SEED INVESTMENTS				**11 751 650**
TOTAL INVESTMENT IN ASSOCIATES				**48 196 020**

Note 13 Tax

Simula Research Laboratory AS is liable to taxation for the part of the business that concerns contract research. The subsidiary Simula School of Research and Innovation AS does not conduct taxable business. The subsidiaries Simula Innovation AS and Simula Consulting AS are taxable. The subsidiaries Simula Metropolitan Center for Digital Engineering AS and Simula UiB AS are liable to taxation on income from contract research.

	SRL	SIMULA GROUP	
Taxation for the year consists of:	**2020**	**2020**	**2019**
Tax payable	230 100	428 531	74 604
Change in deferred tax	-166 237	-166 237	
TOTAL TAX EXPENSE	**63 863**	**262 294**	**74 604**
Tax payable for the year is calculated as follows:			
Profit before tax*	10 198 301	20 615 569	31 565 724
Permanent differences	-8 736 844	-21 701 831	-34 640 601
Change in temporary differences	-415 550	441 406	2 899
Deficit to carry forward	-	-	3 071 978
Deficits and differences that are not included in the basis	-	2 592 725	-
Basis for taxable contract research	1 045 907	1 947 869	339 110
TAXABLE INCOME	**1 045, 907**	**1 947 869**	**339 110**

	SRL	SIMULA GROUP	
Temporary differences:	**2020**	**2020**	**2019**
Other differences	-1 975 000	-1 947 512	34 360
Fixed assets	-5 581 248	-5 701 342	-13 278
Loss carryforward	-	-5 429 198	-3 555 161
Write-down of shares	-	-1 220 754	-1 220 754
Total basis for deferred tax asset	-7 556 248	-14 298 806	-4 754 833
Deferred tax liability/asset	-1 662 375	-3 145 737	-1 046 063
Unrecognised deferred tax liability	-1 496 138	-2 979 500	-1 046 063
RECOGNISED TAX LIABILITY	**-166 237**	**-166 237**	**-**
Tax payable in the balance sheet:			
Tax payable on the profit for the year	230 100	428 531	74 604
Tax payable on group contributions paid	-230 100	-230 100	-
TOTAL TAX PAYABLE IN THE BALANCE SHEET	**-**	**198 431**	**74 604**

As of 2020, SRL is taxable for income from contract research. In 2020, the company had income from contract research corresponding to 13% of turnover.
* The line “Profit before tax expense” contains only profit from taxable entities.

Note 14 Rental and leasing contracts

The company has entered into three leasing agreements concerning photocopiers and coffee machines that expires in 2021.
This year’s cost is kr. 358 622,-

Note 15 Receivables and liabilities

Long-term debt due in more than five years	SRL		SIMULA GROUP	
	2020	**2019**	**2020**	**2019**
Pre-seed funds from Innovasjon Norge AS	-	-	14 000 000	14 000 000
TOTAL	**-**	**-**	**14 000 000**	**14 000 000**

Cash flow statement

SRL			SIMULA GROUP	
2019	**2020**		**2020**	**2019**
		CASH FLOW FROM OPERATING ACTIVITIES		
10 937 708	10 134 438	Net profit for the year	21 212 056	42 121 243
2 307 440	1 831 502	Depreciation and write-downs	3 090 536	2 679 042
-	-	Change in value of shares	6 025 017	2 753 029
-8 385 502	27 025 004	Change in receivables	11 140 940	564 281
12 688 345	-17 745 515	Change in current liabilities	9 101 491	11 659 577
17 547 991	**21 245 429**	**NET CASH FLOW FROM OPERATING ACTIVITIES**	**50,570,040**	**59 777 172**
		CASH FLOW FROM INVESTING ACTIVITIES		
-	-	Changes in connection with arrival/disposal of subsidiary	3 000 000	-3 974 107
-268 267	-	Net investments in operating assets	-3 414 226	-1 246 513
-5 065 000	-1 708 232	Net investments in/sale of shares	-12 314 173	-22 525 601
-5 333 267	**-1 708 232**	**NET CASH FLOW FROM INVESTING ACTIVITIES**	**-12 728 399**	**-27 746 221**
		CASH FLOW FROM FINANCING ACTIVITIES		
-	-	Repayment of loans	-	4 000 000
-	-	Injected equity	224 698	-
-	-166 237	Change in deferred tax/tax benefit	-166 237	-
-	**-166 237**	**NET CASH FLOW FROM FINANCING ACTIVITIES**	**58,461**	**4 000 000**
12 214 724	19 370 960	Net cash flow for the year	37 900 102	36 030 951
29 107 761	41 322 485	Cash holdings 01.01	112 204 552	76 173 601
41 322 485	60 693 445	CASH HOLDINGS 31.12	150 104 654	112 204 552
		THIS CONSISTS OF:		
10 258 757	17 556 547	Change bank deposits	-15 261 708	34 074 984
1 955 967	1 814 413	Changing financial current assets	53 161 810	1 955 967
12 214 724	**19 370 960**	**TOTAL SUM**	**37 900 102**	**36 030 951**

Til generalforsamlingen i
SIMULA RESEARCH LABORATORY AS

UAVHENGIG REVISORS BERETNING

Uttalelse om revisjonen av årsregnskapet

Konklusjon
Vi har revidert SIMULA RESEARCH LABORATORY AS' årsregnskap som viser et overskudd for selskapsregnskapet på kr. 10.134.438,- og et overskudd for konsernregnskapet på kr. 21.212.056,-, og etter vår mening:

- er årsregnskapet avgitt i samsvar med lov og forskrifter
- gir selskapsregnskapet et rettvisende bilde av den finansielle stilling til SIMULA RESEARCH LABORATORY AS per 31. desember 2020 og av selskapets resultater og kontantstrømmer for regnskapsåret som ble avsluttet per denne datoen i samsvar med regnskapslovens regler og god regnskapsskikk i Norge.
- gir konsernregnskapet et rettvisende bilde av den finansielle stilling til konsernet SIMULA RESEARCH LABORATORY AS per 31. desember 2020 og av konsernets resultater og kontantstrømmer for det avsluttede regnskapsåret i samsvar med regnskapslovens regler og god regnskapsskikk i Norge.

Årsregnskapet består av:

- selskapsregnskapet, som består av balanse per 31. desember 2020, resultatregnskap og kontantstrømoppstilling for regnskapsåret avsluttet per denne datoen og noter, herunder et sammendrag av viktige regnskapsprinsipper, og
- konsernregnskapet som består av balanse per 31. desember 2020, resultatregnskap og kontantstrømoppstilling for regnskapsåret avsluttet per denne datoen og noter, herunder et sammendrag av viktige regnskapsprinsipper.

Grunnlag for konklusjonen
Vi har gjennomført revisjonen i samsvar med lov, forskrift og god revisjonsskikk i Norge, herunder de internasjonale revisjonsstandardene (ISA-ene). Våre oppgaver og plikter i henhold til disse standardene er beskrevet i Revisors oppgaver og plikter ved revisjon av årsregnskapet. Vi er uavhengige av selskapet slik det kreves i lov og forskrift, og har overholdt våre øvrige etiske forpliktelser i samsvar med disse kravene. Etter vår oppfatning er innhentet revisjonsbevis tilstrekkelig og hensiktsmessig som grunnlag for vår konklusjon.

Øvrig informasjon
Ledelsen er ansvarlig for øvrig informasjon. Øvrig informasjon består av årsberetningen, men inkluderer ikke årsregnskapet og revisjonsberetningen.

Vår uttalelse om revisjonen av årsregnskapet dekker ikke øvrig informasjon, og vi attesterer ikke den øvrige informasjonen.

I forbindelse med revisjonen av årsregnskapet er det vår oppgave å lese øvrig informasjon med det formål å vurdere hvorvidt det foreligger vesentlig inkonsistens mellom øvrig informasjon og årsregnskapet, kunnskap vi har opparbeidet oss under revisjonen, eller hvorvidt den tilsynelatende

Dronningens gate 6, 0152 Oslo Revisornr.: 971 142 952 Bankgiro 6030.05.53128
Tlf.: 22 00 45 00
E-mail: firmapost@lundes-revisjon.no

inneholder vesentlig feilinformasjon. Dersom vi hadde konkludert med at den øvrige informasjonen inneholder vesentlig feilinformasjon er vi pålagt å rapportere det. Vi har ingenting å rapportere i så henseende.

Styrets og daglig leders ansvar for årsregnskapet
Styret og daglig leder er ansvarlig for å utarbeide årsregnskapet i samsvar med lov og forskrifter, herunder for at det gir et rettvisende bilde i samsvar med regnskapslovens regler og god regnskapsskikk i Norge. Ledelsen er også ansvarlig for slik intern kontroll som den finner nødvendig for å kunne utarbeide et årsregnskap som ikke inneholder vesentlig feilinformasjon, verken som følge av misligheter eller utilsiktede feil. Ved utarbeidelsen av årsregnskapet må ledelsen ta standpunkt til selskapets evne til fortsatt drift og opplyse om forhold av betydning for fortsatt drift. Forutsetningen om fortsatt drift skal legges til grunn for årsregnskapet så lenge det ikke er sannsynlig at virksomheten vil bli avviklet.

Revisors oppgaver og plikter ved revisjonen av årsregnskapet
Vårt mål er å oppnå betryggende sikkerhet for at årsregnskapet som helhet ikke inneholder vesentlig feilinformasjon, verken som følge av misligheter eller utilsiktede feil, og å avgi en revisjonsberetning som inneholder vår konklusjon. Betryggende sikkerhet er en høy grad av sikkerhet, men ingen garanti for at en revisjon utført i samsvar med lov, forskrift og god revisjonsskikk i Norge, herunder ISA-ene, alltid vil avdekke vesentlig feilinformasjon som eksisterer. Feilinformasjon kan oppstå som følge av misligheter eller utilsiktede feil. Feilinformasjon blir vurdert som vesentlig dersom den enkeltvis eller samlet med rimelighet kan forventes å påvirke økonomiske beslutninger som brukerne foretar basert på årsregnskapet.

For videre beskrivelse av revisors oppgaver og plikter vises det til
https://revisorforeningen.no/revisjonsberetninger

Uttalelse om øvrige lovmessige krav

Konklusjon om årsberetningen
Basert på vår revisjon av årsregnskapet som beskrevet ovenfor, mener vi at opplysningene i årsberetningen om årsregnskapet og forutsetningen om fortsatt drift er konsistente med årsregnskapet og i samsvar med lov og forskrifter.

Konklusjon om registrering og dokumentasjon
Basert på vår revisjon av årsregnskapet som beskrevet ovenfor, og kontrollhandlinger vi har funnet nødvendig i henhold til internasjonal standard for attestasjonsoppdrag (ISAE) 3000 «Attestasjonsoppdrag som ikke er revisjon eller forenklet revisorkontroll av historisk finansiell informasjon», mener vi at ledelsen har oppfylt sin plikt til å sørge for ordentlig og oversiktlig registrering og dokumentasjon av selskapets regnskapsopplysninger i samsvar med lov og god bokføringsskikk i Norge.

Oslo, den 3. mars 2021

Erik A. Bell
Statsautorisert revisor

Gender equality, social responsibility and working environment

Gender balance at Simula

The Simula Group consists of six companies: Simula Research Laboratory (SRL), Simula Metropolitan Center for Digital Engineering (SimulaMet), Simula UiB, Simula School of Research and Innovation (SSRI), Simula Innovation and Simula Consulting. The Group has a total of 184 employees, of whom 159 are in full-time positions. SRL has a total of 64 employees, of whom 52 are full-time. Gender balance in the Group and in SRL is shown in Table 1 as the number of men and women employed in full-time positions and in other working conditions in Table 2. To ensure employees' anonymity, specific job titles have been grouped into larger categories, such that each comprises at least five men and five women at the Group level.

Due to the nature of Simula's work, many employees are hired either in temporary or part-time positions. Temporary recruitment positions are typically those occupied by PhD and postdoctoral fellows. The category 'adjunct research scientist' describes part-time scientific employees whose primary employment is elsewhere. The total number of employees in such positions can vary from year to year depending on the amount of externally funded projects in progress, but has remained relatively stable over time.

Table 1: Gender balance in full-time positions at Simula. Job categories with less than five women and five men are not reported and are marked with a dash (-).

	SIMULA GROUP		SRL	
Job categories at Simula	**No. women**	**No. men**	**No. women**	**No. men**
Total	53	106	20	32
Group management	6	7	-	-
Research positions	11	36	7	18
Recruitment positions	25	61	5	7
Administrative positions	17	9	-	-

Job categories in Table 1:

- Group management: includes the CEO, company directors and managers who are part of the management group.
- Research positions: includes researcher I, II and III positions (not including adjunct research scientists), and engineers.
- Recruitment positions: trainees, PhDs, postdocs.
- Administrative positions: HR, finance, communication, IT operations.

Table 2: Gender balance in terms of other employment variables:

	Temporary staff		Actual part-time		Involuntary part-time		Parental leave	
	Women	**Men**	**Women**	**Men**	**Women**	**Men**	**Women**	**Men**
Simula Group	33	78	7	18	0	0	90	58
SRL	9	14	4	8	0	0	59	15

The groupings in Table 2 are defined as follows:

- Temporary staff: mainly recruitment positions (PhDs and postdocs), adjunct professor positions, interns and assistants/substitutes. Stated in numbers of employees.
- Actual part-time: includes both research and administrative employees at Simula. The majority of the employees in this category have positions with other employers that are relevant to the work they perform at Simula (e.g., these are mainly adjunct research scientist positions). Stated in numbers of employees.
- Involuntary part-time: none of the part-time employees wish to work more; most are adjunct positions whose occupants have other primary employers.
- Parental leave: stated in number of weeks.

Simula's work for equality and against discrimination

Simula relies on the competence and motivation of skilled employees in order to achieve its goals. Recruiting highly qualified researchers from around the world means Simula has become an increasingly diverse workplace. Simula's employees currently represent 39 different nationalities (54% come from countries other than Norway – see Figure 1); 33% are women (women make up 28% of full-time scientific employees – see Figure 2). This diversity provides a variety of perspectives and approaches, as well as contributing to a more dynamic and creative workplace. This is particularly beneficial in view of Simula's extensive international co-operations.

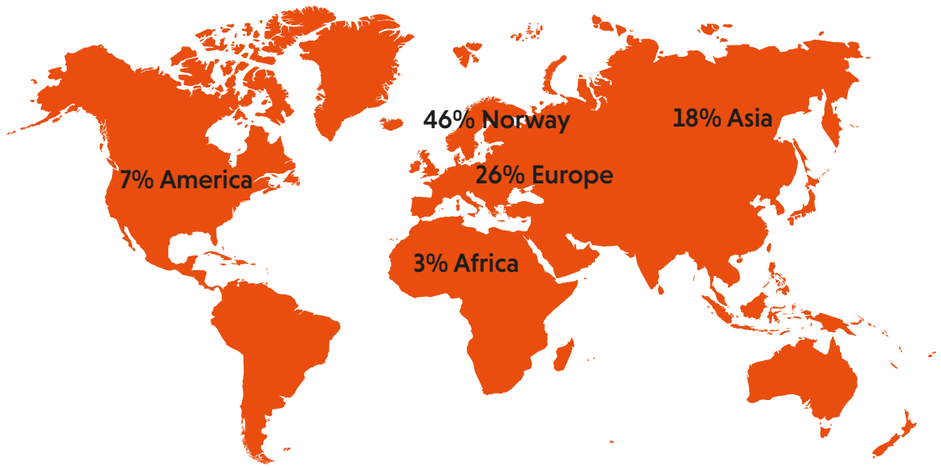


Figure 1: Simula is a diverse workplace. The figure shows the proportion of employees from different continents.

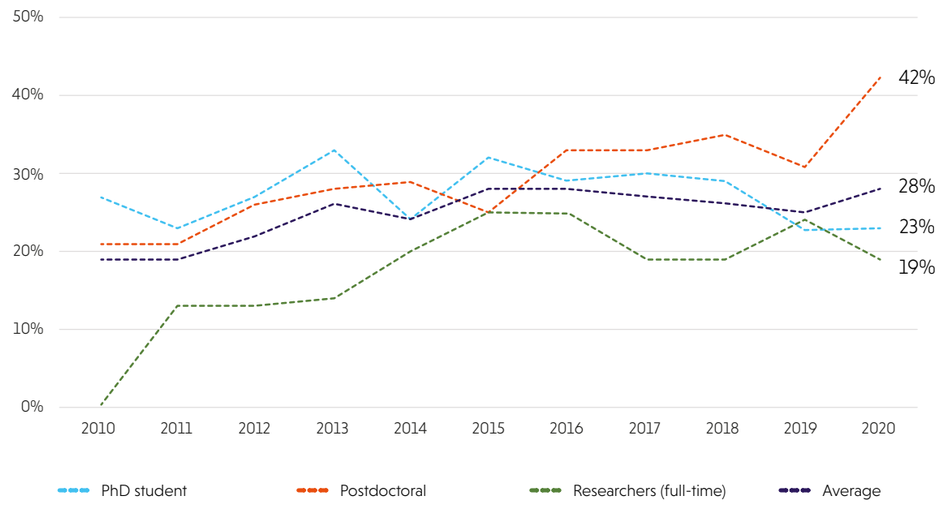


Figure 2: Proportion of women in scientific positions at Simula

General principles for gender equality and anti-discrimination

Working towards gender equality is firmly anchored in Simula's management approach, and in various strategies and guidelines:

- Simula has worked purposefully to recruit and cultivate female research talent for over 10 years. Simula's initial goal to increase the proportion of women in research positions to 25% was achieved in 2013. By 2028, Simula aims to have 40% of such positions filled by women.
- Extensive work in health, safety and environment (HSE) is carried out regularly. This involves health and safety representatives, the working environment committee, PhD forum, HR and the welfare committee. In addition, employee well-being surveys and broader working environment surveys are conducted regularly.
- The boards of directors in Simula companies receive regular reports on employee welfare, both routinely (for example, HSE reports to each board meeting) and regarding significant issues that may affect employees. Throughout 2020, the boards have been specifically updated on the consequences of the Covid-19 pandemic and accompanying measures for employees, as well as employees' work with the Smittestopp app for digital contact tracing.
- Simula's culture document clearly describes our core values and expectations for a good and inclusive workplace; this document is published on the company website.
- A section on social responsibility and the working environment has been included in the Simula annual report since 2012. As this section included summaries of Simula's work to promote gender equality this information now forms part of this report.
- Simula has clear guidelines to prevent all forms of harassment, with a corresponding notification system in place. In short: "Simula will not accept or tolerate any form of harassment, victimization or discrimination based on religion, gender, sexual orientation, age, nationality, physical disability or political views."

Practical procedures for equality and anti-discrimination

Simula works actively and deliberately with equality and non-discrimination, which are essential components of Simula's efforts to ensure good working conditions in practice. Responsibility for this work is shared across several functions, including health and safety representatives, the working environment committee, HR, managers at all levels, the directors, group management and the boards of directors. These groups meet regularly to carry out this work. For example, the working environment committee meets four times a year to discuss topics relevant for employees and to pass on any particular concerns employees may have. The management group meets monthly to deal with pertinent issues across the Group (for example, the working environment and gender equality). Formal decisions from the boards and the management group are implemented by the administration and often involve the cooperation of employee representatives (e.g., health and safety or trade union representatives). Information flow is ensured through regular meetings between department heads and selected administrative functions. In addition, all employees are responsible for safeguarding the Simula culture and contributing to an inclusive work environment. Employees also have a duty to make known any form of harassment they may encounter at work.

As a result of this extensive work over many years, Simula has developed several programmes that actively contribute to equality and non-discrimination. The current programmes and measures taken are described below.

Working environment

Quality assurance and continuous workplace development at Simula is facilitated by means of an internal inspection system that embraces health, safety and the working environment. The working environment committee strives to develop and maintain the quality of the working environment and to follow up on questions related to employee safety, health and welfare. The results of the working environment survey conducted in the autumn of 2018 were very good, showing improvements in most categories versus the 2014 survey and compared with the research-institutes sector in general. Although this confirms that the working environment at Simula is good and that employees are satisfied, the work to follow up on the results in the individual units and in the Group as a whole continues. The next working environment survey is scheduled to be carried out in 2022.

Working conditions in 2020 were of course influenced by the Covid-19 pandemic. From Norway's first lockdown in March 2020 and through the rest of year, employees were required to work from home with very few exceptions (for example, those requiring access to specialised equipment at the office). Employees' home offices were equipped with extra screens, ergonomic chairs and so on, to ensure the best possible working conditions. Simula conducted two employee surveys in 2020 that focused on working conditions at home, which enabled Simula to adapt measures insofar as possible to employees' individual needs. Efforts were also made to facilitate physical and digital meeting places that helped to sustain social activity, in line with public health measures.

Facilitation of and opportunities to combine work and family life

Simula has several initiatives in place to facilitate a good work-life balance, including family life. With flexible working hours, employees are better able to combine a demanding career with activities and responsibilities outside work. Simula introduced a 'baby bonus' scheme that gives new parents a one-time bonus of NOK 25 000 while those in recruitment positions (PhDs and postdocs) receive four months' extra funding. Simula also recently established a sponsorship programme whereby employees can apply for support for organised leisure activities outside work. Such measures demonstrate Simula's desire to be a good workplace for all employees, regardless of their life situation.

Recruitment and professional development

Simula continuously works to attract, develop and retain talented researchers of diverse backgrounds. Simula's recruitment guidelines require qualified candidates of both sexes to be called in for interview. The guidelines are regularly communicated to employees responsible for recruiting new researchers. For those recruited from abroad, Simula facilitates a quick and positive transition to the Norwegian workplace through administrative support, social activities and Norwegian language training, among other measures. Language training is also offered to the spouses/partners of new employees relocating to Norway.

Simula promotes career development by providing access to the professional and administrative resources necessary to establish oneself as a researcher. All employees are encouraged to sign up for courses and training opportunities that can contribute to their development as experts and leaders. Since 2016, several project managers have attended intensive leadership training programmes at internationally recognised institutions such as Stanford University, the Wharton School and London Business School. Simula also arranges seminars for supervisors focused on relevant and challenging topics, and offers similar training for PhD students and postdocs to develop the understanding and skills required as a supervisor. Unfortunately, the scheduled course offerings for 2020 were cancelled due to Covid-19 and if physical attendance remains impossible in 2021, these will be offered digitally.

Salary structure

Every other year, Simula conducts a evaluation of salary conditions in the organization. This was most recently conducted in 2019. The goal is twofold: to assess whether salary levels at Simula are competitive (external perspective) and if they reflect the individual responsibilities required and job category (internal perspective). Fixed salaries are used as the baseline to calculate wage differences between Simula employees, while considering similar positions (e.g. PhD students), work of equal value (e.g. consultants in HR and communications staff) and individual assessments related to such variables as education, experience and individual contribution. The deviations identified are corrected. The next review will be carried out in 2021, and the methodology adapted according to ARP (equality and anti-discrimination legislation) requirements.

Promotion

Every year, Simula assesses scientific staff for promotion according to established criteria for each role. Those meeting the requirements are duly promoted.

Absence due to illness

Sick leave is generally low at Simula. In 2020, absence due to illness was 1.9% across the Group (0.8% for SRL). Simula has an agreement with NAV (the Norwegian Labour and Welfare Administration) concerning "the inclusive workplace". Its purpose is to prevent and reduce absence related to illness, improve job attendance and the working environment, and minimise exclusion and withdrawal from working life. An action plan that focuses on how Simula addresses these matters is discussed with NAV on an annual basis.

Conflict management and work against harassment

Simula aims to ensure a safe and secure working environment in accordance with the Group's principles on culture in the workplace. As such, Simula shows consideration for employees' individual needs and does not accept or tolerate any form of harassment, expulsion or discrimination based on religion, gender, sexual orientation, age, nationality, disability or political views. Simula's guidelines for conflict resolution and notification encourage employees to take an active role in creating an working environment where conflict is handled in an open, honest and constructive way, and in efforts to prevent destructive forms of conflict from arising in the first place.

Ethics

Maintaining high ethical standards is inherently valuable not only for Simula but also for each individual employee. The Group's Code of Ethics was developed to increase awareness of, and compliance with, the high ethical standards required of all employees. This code covers topics including research ethics; the working environment and inclusion; gifts, enticements and corruption; confidentiality; and conflicts of interest. Adhering to these standards creates a foundation of trust for collaborating with partners in research, as well as Norwegian society in general.

How Simula works for equality and non-discrimination

Simula's work for gender equality and anti-discrimination is a continuous interaction between several key players in the Group, including management, the board, administration, employees and employee representatives. Simula's administration already based much of its work on a 4-step working cycle, but in 2021 will intensify this focus so that reporting for 2021 to a greater extent reflects the statutory working method:

1. Examine the risk of discrimination and obstacles to equality
2. Analyse causes
3. Implement measures
4. Evaluate results

During 2019 and 2020, Simula carried out a targeted process to identify discrimination and gender equality risks, and to develop corresponding measures. A committee consisting of employees and management representatives examined the gender equality situation at Simula, comparing it with "best practice" in Norway, and identified measures that were subsequently implemented in 2020. Selected examples from this work can be found in Table 3.

Table 3: Selected examples of work with risk identification and initiative development from 2019-2020

	POTENTIAL RISK	POSSIBLE CAUSES	CORRESPONDING MEASURES	EFFECT OF MEASURES
1.	Possible risk that highly qualified candidates will not be identified in the recruitment processes, and thus will not be considered.	Lack of overall structure in recruitment processes that ensure objective assessment of the applicants' qualifications and suitability for the position.	Requirement that at least one qualified candidate of each gender be called in for an interview.	It was reported that at least two highly-qualified women were hired on a new project that would otherwise not have been considered.
2.	Possible risk of slower professional advancement among women researchers.	Women researchers publish less and apply for fewer externally funded projects.	Develop a quality assurance process that supports all researchers in the grant application process.	Applications have received better evaluation scores; the gender dimension is not yet clear.
3.	Possible risk of the "leaky pipeline" known in academia - do we have good enough measures to ensure that we retain talented female researchers at senior levels in the organization?	Parts of the working environment are not sufficiently adapted to attract and retain the best researchers – regardless of gender, background or life situation.	Need for increased competence in the organization and knowledge of best practice. An application for a participation project in the BalanseHub network was thus prepared and submitted.	The BalanseHub application was granted and the project started 1.1.2021 (see below for details).

The new requirements from ARP state that work for equality and anti-discrimination should be carried out through more active collaboration with employee representatives according to the statutory working method. A structure that more clearly reflects this is in the process of being defined, and will be included as part of Simula's gender equality report from, and including, financial year 2021.

Measures from and including financial year 2021

In addition to continuing those mentioned above, new measures will be introduced during 2021 (see Table 4). Many of these are organised under Simula's "HiddenFigures" project, which is part of the Research Council of Norway's "BalanseHub"[1] programme supporting cultural and structural changes that promote equality and gender balance in research institutions. HiddenFigures aims to achieve long-term gender balance and diversity by creating a management culture across Simula that is inclusive of researchers' different backgrounds and life situations. Through BalanseHub, Simula will also learn from other participants' projects, drawing on updated knowledge and proven practices to further the work with equality and anti-discrimination.

Table 4: Summary of the new measures planned for 2021.

AREA	MEASURES
Recruitment	• Prepare training materials to support employees in the recruitment role
Development opportunities	• Update information on available development opportunities for all employees on Simula's intranet pages • Arrange leadership development workshops with a focus on creating an inclusive work environment • Establish mentor groups that provide realistic career advice as well as support from peers • Facilitate access to a diverse selection of guest lecturers and seminars
Diversity and combining work and family life	• Implement a structure to facilitate conversations between a manager and their employee that is returning from a period of leave in order to plan for any necessary adaptations ("re-boarding")
Wages	• Perform analysis of salary conditions in the organization
Work environment	• Hold meetings with safety representatives, employee representatives and working environment committee for discussion on working methods and planned measures • Plan the next working environment survey • Evaluate home office use guidelines (post-pandemic)

1 BalanseHub is a part of the Norwegian Research Council programme "BALANSE - Gender Balance in Senior Positions and Research Management".

Education and Outreach Activities

Simula's educational and outreach activities are organised through the Simula School of Research and Innovation (SSRI).

Simula's researchers supervise students at the Master's and Doctoral level as an integrated part of the research. SSRI has the overall responsibility for all PhD students and postdoctoral fellows in the Simula group. In addition to general administrative functions, SSRI organises several courses, seminars and supervisor training aimed for our students and researchers. Some of these courses are also open to PhD candidates not affiliated with Simula.

In 2020, Simula's scientific staff supervised eight candidates to the completion of their doctoral degree and 24 students to the completion of their master's degree. From 2001 until the end of 2020, a total of 141 doctoral candidates and 476 Master students have been supervised to completion at Simula.

SSRI teaches, inspires and educates young people in science and technology. In addition, our PhD students instruct teachers in programming.

Prepare

Under the Prepare project, Simula recruits high-school students as ambassadors who visit local schools to inspire other students and increase their interest in technology and science. SSRI trains each ambassador to present scientifically complicated topics in an easy and appealingly way.

In 2020, our ambassadors held 27 scientific lectures for approximately 750 students—most of the lectures where held digitally due to the Covid-19 pandemic. Lecture subjects included the work of Simula, short courses and tasks in the programming language Python, and demonstrations of relevant research projects.

Kodeskolen ("Code School")

The Code School offers programming courses for teachers featuring an introduction to Python and how to facilitate learning in subjects such as mathematics and science.

In 2020, the activities were affected by the pandemic. A few courses were cancelled while others were held digitally. The Code School arranged courses for teachers in Asker, Vestby and Andøya municipalities, Tekna Realistene and Tekna.

In collaboration with Oslo Metropolitan University and with funding from the Norwegian Agency for International Cooperation and Quality Enhancement in Higher Education, the Code School arranged two courses for participants that had been furloughed or were unemployed.

In 2020, SSRI held a course for children for the first time. Over the winter break (end of February), 40 children between the ages of 10-12 spent either two or three days at Simula Fornebu, where they were introduced to programming.

Summer Internships

Every year, SSRI hires students for summer internships, mainly at our Fornebu location. Interns are supervised by PhD candidates or researchers in postdoctoral positions. Between June and August 2020, 19 Norwegian students were employed as summer interns at SSRI.

SSRI in numbers 2020

19
students held a summer job at Simula

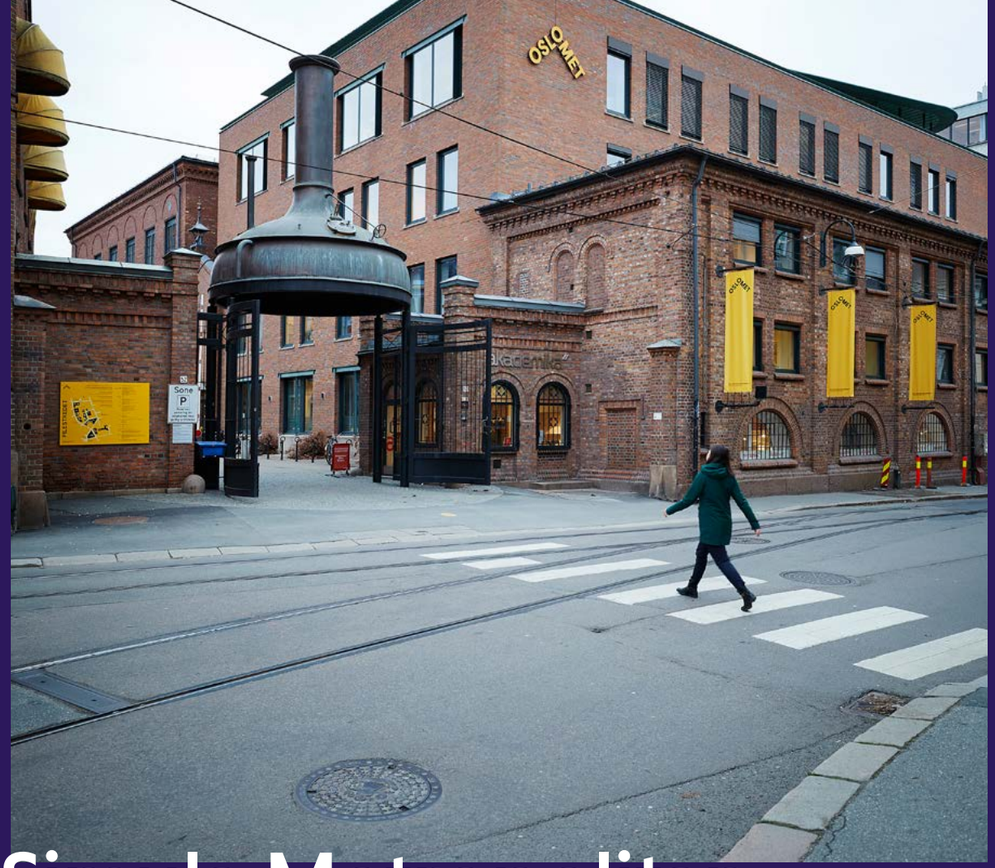
27
lectures from our Prepare ambassadors for over 750 students

8
students were supervised to the completion of their PhD

24
students were supervised to the completion of their Master's degree

10
different Code School courses for teachers and Tekna Realistene

172
furloughed persons participated in programming and computer science courses



Simula Metropolitan Center for Digital Engineering

Simula Metropolitan Center for Digital Engineering (SimulaMet) is a research institution established in response to the needs of Norway, and more broadly of Europe, to strengthen research and education capacity in ICT and digitalisation. Simula Research Laboratory AS (SRL) and Oslo Metropolitan University (OsloMet) joined forces to found this new company, whose mission is to conduct research in digital engineering at the highest international level, educate and supervise PhD and Master's students at OsloMet, and contribute to innovation in society through collaboration, start-up-companies and licensing of research results.

Establishing the organisation

SimulaMet started out with a small group of senior researchers in January 2018, with Professor Olav Lysne as director. The center has grown tremendously since then. As of 31 December 2020, a group of 59 people representing 21 different nationalities are formally affiliated with SimulaMet. Of these, 14 are PhD students and 13 are postdoctoral fellows. In addition, the company has many collaborating partners and guests closely associated with the activities in the center.

Activities and research results

SimulaMet is now well established within its three core research areas: Communication Systems, Machine Learning and Artificial Intelligence, and IT management.

In addition to the basic funding provided by the owners, several research projects have been awarded funding from external sources. This enables the expansion of activities and strengthens collaboration with partners and the industry, academia and public bodies. External funding sources include the Norwegian Ministry of Local Government and Modernisation, the Research Council of Norway and EU's Horizon 2020 platform.

SimulaMet's primary goal is to generate research results at the highest level. Over the three initial years, SimulaMet researchers have authored books, published journal and conference publications, and supervised PhD and Master's candidates. In addition to teaching, the scientific staff organise workshops, conferences, industry seminars and summer schools, publish open data sets and source code, are advisors and members of governmental boards and academies.

In 2020, SimulaMet's activities were affected by the Covid-19 pandemic, with limited opportunities to arrange and participate in conferences and summer schools. As a result, some planned summer schools have been postponed, and digital alternatives were established and implemented wherever possible.

SimulaMet was also heavily involved in the development of the Smittestopp app on behalf of the Norwegian Institute of Public Health. For more information, see pages 4-5.

New initiatives

In the spring of 2020, SimulaMet opened a 5G lab named the SimulaMet Interoperability Lab (SMIL). SMIL is an experimental environment for research and innovation related to wireless technology, focusing on 5G and the Internet of Things. SMIL studies how 5G technology works, how new services can utilize 5G in the future, and how to further develop the technology. Interoperability means that the goal is to study various technologies simultaneously, in interaction and together. The lab works closely with key technology players in the field and is equipped with technical equipment from multiple suppliers, which makes it possible to study interoperability. SMIL is led by Chief Research Scientist Ahmed Elmokashfi and Research Professor Haakon Bryhni, and more researchers and students will be able to be connected with the activities in the laboratory in the future.

Effektiv Digitalisering av Offentlig Sektor (EDOS) is a research center that conducts surveys and analyses information about digitization in the public sector. The research aims to provide knowledge about what leads to successful digitalization in the public sector and disseminate knowledge that leads to higher efficiency and value creation. The center was established in 2020 and is funded by the Ministry of Local Government and Modernization. The center is led by Professor Magne Jørgensen.

Strategic partnership with OsloMet

A key role for SimulaMet is to be OsloMet's strategic partner in both research and PhD- and Master's-education within digital engineering. During its three years in existence, this partnership has led to a number of results: a PhD program in Engineering Science at OsloMet has been established; five researchers hold joint positions in the two organisations; several collaborative research proposals have been submitted, resulting in new, externally funded projects that reinforce the collaboration. As of December 31, 2020, SimulaMet has 13 PhD students admitted to the doctoral program at the Faculty of Technology, Art and Design (TKD) at OsloMet. In addition, SimulaMet staff teach courses at PhD and Master's level at OsloMet.

In 2020 the partners have also jointly formed the OsloMet Artificial Intelligence Lab (OsloMet AI Lab). The center focuses on a multidisciplinary approach and development of artificial intelligence for people and society. OsloMet AI Lab manages research and students' projects in artificial intelligence, both applied and basic research, including theory and the use of machine learning in various applications. The activities involve students and researchers from both sides.

Simula UiB

Simula UiB specialises in cybersecurity and conducts research and education in cryptography and information theory. The company is owned by Simula Research Laboratory AS (SRL) and the University of Bergen (UiB).

Both research sections (Cryptography and Information Theory) publish in reputable journals, including IEEE Transaction on Communications and IEEE Transactions on Information Theory and present work at respected conferences such as the RSA Conference and Asiacrypt. In total, Simula UiB has supervised 24 Master's students and five PhD candidates to completed degrees since its establishment. Several of the company's graduate candidates work for Norwegian companies that require security clearance.

After an increase in the number of employees in 2019, the number stabilised in 2020. At year-end, the company has 31 people associated with the center. The cryptography section has three Chief Research Scientists in a full-time position and one professor in a 20% adjunct position. The information theory section has one Chief Research Scientist, one Research Scientist, and a professor in a 20% adjunct position. The researchers at Simula UiB supervise five postdoctoral fellows, 14 PhD candidates and ten Master's students. All students affiliated with Simula UiB will receive their degree from the University of Bergen.

At the beginning of 2020, the company moved into new, modern premises in the neighbouring building to the Department of Informatics at the University of Bergen. The premises have room for guests as well as good opportunities for project collaboration. In 2020, the measures to combat the Covid-19 pandemic led to fewer guests and smaller collaborative projects than planned, but conditions are in place as soon as it is deemed safe.

External cooperation

Section leader and cryptologist Håvard Raddum has received a security clearance and will start in a 20% position with the National Security Authority (NSM). In collaboration with Widenorth, Simula UiB has worked on two secure and robust satellite communication projects for the European Space Agency (ESA). A partnership with the research lab Numenta (numenta.com) has resulted in several biologically based machine intelligence papers. At the turn of the year, Simula UiB is negotiating new agreements within contract research and teaching.

Work environment

Simula UiB has developed a good working environment through targeted work in health, safety and environment (HSE). As of 31 December 2020, absence due to sickness was 0.44%. The measures against the Covid-19 pandemic meant that employees had to work from home for long periods without the opportunity to meet colleagues. This was particularly demanding for new employees from abroad. The administration at Simula UiB has reduced the isolation problems through conversations and virtual events, delivering home office supplies and arranging trips outdoors on the weekends.

Laboratory

Throughout 2020, the Simula UiB laboratory has developed an Internet-of-things testbed, the purpose of which is to evaluate methods for distributed and edge computing, routing and mesh networking, error control coding, and cryptography over low-power devices. The testbed consists of off-the-shelf hardware components coupled with the software infrastructure needed for low-level control over radio and computing resources.

The lab's long-term goals are to produce candidates with combined hardware/software expertise for the Norwegian crypto and communications industry. Furthermore, Simula UiB plans to develop demonstrators and prototypes that can demonstrate secure technology for politicians, industry and defence.

Innovation

Simula has long been dedicated to the pursuit of research with a clear potential value to society. Since 2005, the bulk of Simula's innovation activities has been organised through Simula Innovation. In 2015, Simula founded an incubator for start-ups (the Simula Garage), which was followed by a second Garage at OsloMet in 2018. At the beginning of 2020, Simula Consulting was launched in order to bring Simula's research expertise to solve real-world challenges.

Simula Innovation

Simula Innovation (SI) is building a substantial portfolio of investments, consisting of spinout companies stemming from Simula's internal research and external tech start-up companies.

Since 2018, SI has experienced substantial growth in terms of both new investments and exits, which occurs by selling part or all of one's shares in the companies. In 2020, SI had two exits and invested in seven new companies.

As of the 2020 year-end, SI's investment portfolio included 32 companies, with combined revenue of over 300 million NOK and 330 employees. The 32 companies are grouped into the following eight categories: software, networks, salestech, proptech, fintech, medtech, media, and sport.

The Simula Garage

The Simula Garage (Norwegian: Gründergarasjen) is an incubator for ambitious entrepreneurs working on early-stage ICT-related projects. The Garage offers 12 months of free working space, start-up guidance and support, and gives start-ups the possibility to connect with an extensive network of researchers, students, and technology experts.

In 2020, the Garage accepted 20 new members and now counts 34 companies. Simula Innovation invested in three start-ups connected to the Garage.

The Garage has two locations. One is co-located with Simula Research Laboratory at Fornebu. The other is co-located with SimulaMet in downtown Oslo, in collaboration with Oslo Metropolitan University (OsloMet). The Garage at OsloMet came about as part of OsloMet's innovation effort, where OsloMet provide premises, infrastructure and access to additional researchers, while Simula Research Laboratory is responsible for the daily operations.

Simula Consulting

Established at the start of 2020, Simula Consulting (SC) aims to bridge the gap between academia and real-world challenges.

SC develops and provides deep-tech solutions tailored to customer needs. By drawing on Simula's expertise in the areas of machine learning, scientific computing, software engineering, networks and security, SC assembles a tailored team of researchers for each individual project. During 2020, SC's two full-time employees were joined by more than 20 researchers from Simula Research Laboratory and SimulaMet in order to assemble the right expertise for each engagement.

One year in, SC has been engaged in 15 projects across a broad range of sectors and businesses, varying from aquaculture to private equity and the wellness industry. For instance, in the fall SC was hired by a company looking for tech solutions to reduce cost and waste of fish feed. This is generally a complex process that currently requires a lot of manual and time-consuming decisions on when to start, stop, and adjust feeding. Moreover, the feeding costs have historically represented about half of the fish farms' production costs. By developing a machine learning and computer vision algorithm, SC created solutions that analyse and classify fish-eating behaviour. This information can help an operator to decide on whether the fish have eaten enough or if they require more food. Not only will this solution reduce human resources and food waste, it is also expected to decrease fish mortality.

SC aims to continue to grow during 2021, while never compromising on excellence, by promoting its services in Norway and abroad.

Photo: Valeriya Naumova, Director, Simula Consulting

Doctorates and Master's degrees 2020

This list presents PhD and MSc degrees awarded by degree awarding institutions in Norway and abroad in 2020.
The degrees are obtained by candidates that are supervised throughout their projects by Simula researchers.

PhD students

STUDENT	TITLE OF THESIS	SUPERVISOR	CO-SUPERVIRSOR(S)	INSTITUTION
Alessio Buccino	A computationally-assisted approach to extracellular neural electrophysiology with multi-electrode arrays	Philipp Häfliger	• Gert Cauwenberghs • Marianne Fyhn • Gaute Einevoll	University of Oslo - Department of Informatics
Matteo Croci	Multilevel Monte Carlo methods for uncertainty quantification in brain simulations	Patrick Emmet Farrell	• Michael Bryce Giles • Marie Elisabeth Rognes	University of Oxford - Mathematical Institute
Timo Klock	Model-based function learning in high dimensions	Valeriya Naumova	• Are Magnus Bruaset	University of Oslo - Department of Informatics
Srimathi Varadharajan	Hard Mathematical Problems in Cryptography and Coding Theory	Håvard Raddum	• Øyvind Ytrehus	University of Bergen - Department of Informatics
Jørgen Dokken	Shape Optimization for Finite Element Methods	W. Simon Funke	• Kent-Andre Mardal • August Johansson	University of Oslo - Department of Informatics
Jeremie Lagravière	The PGAS Programming Model and Mesh Based Computation: an HPC Challenge	Xing Cai	• Phuong Ha	University of Oslo - Department of Informatics
Marcia Vagos	A computational study of Atrial Fibrillation mechanisms at the cardiomyocyte level	Joakim Sundnes	• Mary Maleckar • Hermeneglid Arevalo	University of Oslo - Department of Informatics
Helge Spieker	Software Testing in Continuous Integration with Machine Learning and Constraint Optimization	Arnaud Gotlieb	• Magne Jørgensen • Morten Mossige	University of Oslo - Department of Informatics

Master's students

NAME	THESIS TITLE	SUPERVISOR AT SIMULA	CO-SUPERVISOR(S)	INSTITUTION
Alve Vreim Elde	InfiniBand RDMA over PCI Express Networks	Håkon Kvale Stensland	Pål Halvorsen	University of Oslo - Department of Informatics
Anastasiia Kolevatova	Analysis of the Impact of Land Cover Changes on Climate using Machine Learning	Pål Halvorsen	Michael Riegler, Hugo Lewi Hammer	University of Oslo - Department of Informatics
Emil August Torp Nilsen	Visualization of Large Graphs	Carsten Griwodz	Johannes Langguth, Daniel Thilo Schroeder	University of Oslo - Department of Informatics
Espen Næss	Pyramidal Segmentation of Medical Images via Generative Adversarial Networks	Pål Halvorsen	Michael Riegler, Håkon Kvale Stensland, Vajira Thambawita, Steven Hicks	University of Oslo - Department of Informatics
Ferdinand Schaal	Using Graph Neural Networks to classify Distribution Graphs from Twitter	Johannes Langguth	Daniel Thilo Schroeder, Konstantin Pogorelov	Technical university of Denmark
Hanna Svennevik	Applying artificial intelligence to performance climate predictions	Hugo Hammer	Michael Riegler	University of Oslo - Department of Geosciences
Henning Parratt Tandberg	TCP DA-LBE: A Meta Congestion Controller for Deadline-Aware Less than Best Effort Delivery in the Linux Operating System	David Hayes	David Ros, Özgü Alay	University of Oslo - Department of Informatics
Henrik Gjestang	A self-learning teacher-student framework for gastrointestinal image classification	Pål Halvorsen	Michael Riegler, Vajira Thambawita, Steven Hicks	University of Oslo - Department of Informatics
Henrik Svoren	Emotional Mario: Using Super Mario Bros. To Train Emotional Intelligent Machines	Michael Riegler	Pål Halvorsen	University of Oslo - Department of Informatics
Lucas Georges Gabriel Charpentier	To prune or not to prune: Exploring the effects of nodes in neural networks	Michael Riegler	Pål Halvorsen, Vajira Thambawita, Steven Hicks	University of Oslo - Department of Informatics
Magnus Klausen	Livestreaming Panoramic Video in Dense-User Scenario	Özgü Alay	Anis Yazidi, Hårek Haugerud	University of Oslo - Department of Informatics
Martin Kristoffer Svensen	Reidentifying Anonymised Data Using Machine Learning	Michael Riegler	Pål Halvorsen, Vajira Thambawita, Steven Hicks	University of Oslo - Department of Informatics
Oda Olsen Nedrejord	Artificial Video Generation for Improved Performance on Polyp Detection	Michael Riegler	Pål Halvorsen	University of Oslo - Department of Informatics
Olav Rongved	Automatic event detection in soccer videos	Pål Halvorsen	Håkon Kvale Stensland, Michael Riegler	University of Oslo - Department of Informatics
Tom-Olav Bøyum	Scaling Parallelism in Interactive Programming	Benjamin Ragan-Kelley	Xing Cai	University of Oslo - Department of Informatics
Kristoffer Olsen	Neuroevolution of Artificial General Intelligence	Michael Riegler	Pål Halvorsen, Stefano Nichele, Sidney Pontes-Filho	University of Oslo - Department of Informatics
Svetlana Halnes	Digitalt Grenseforsvar	Øyvind Ytrehus		University of Bergen - Department of Informatics
Marte Hvarnes Evensen	Safety and security of autonomous vessels -- Based on the Yara Birkeland project	Øyvind Ytrehus	Roar Sønstebø Simensen (Kongsberg Maritime)	University of Bergen - Department of Informatics
Erik Vetle Larsen	Non-destructive verification of blind injection vulnerabilities	Øyvind Ytrehus		University of Bergen - Department of Informatics
Markus Johan Ragnhildstveit	Performance and Security of Modern and Post-Quantum Cryptographic Algorithms	Øyvind Ytrehus		University of Bergen - Department of Informatics
Simen Karlsen Lone	Creating Capture-the-Flag Challenges Inspired by Common Crypto Mistakes	Håvard Raddum		University of Bergen - Department of Informatics
Håkon Thorvaldsen	Symmetric Ciphers for Fully Homomorphic Encryption	Håvard Raddum		University of Bergen - Department of Informatics
Martin Tverråen	Differential Power Analysis of SKINNY	Martijn Stam		University of Bergen - Department of Informatics
Anton Frigård	Coding for mobile edge computing, Using Luby-Transform codes to lower the latency in edge computing systems	Alexandre Graell i Amat	Eirik Rosnes	Chalmers University of Technology

List of publications 2020

Simula reports publications where a significant part of the research has been funded by Simula. This means that at least one of the authors of the reported publications must have Simula as his/her main affiliation and has contributed to the publication as specified in Simula's publication guidelines. Publications from people in part-time positions are generally not included unless the research is specifically performed as part of their employment at Simula.

As of December 31, 2020

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Computed Post-Stenotic Flow Instabilities Correlate Phenotypically with Vibrations Measured Using Laser Doppler Vibrometry: Perspectives for a Promising In-Vivo Device for Early Detection of Moderate and Severe Carotid Stenosis, Viviana Mancini, Aslak Bergersen, Kristian Valen-Sendstad, Patrick Segers, Journal of Biomechanical Engineering, vol. 142, pp. 91007, Issue: 9, American Society of Mechanical Engineers Digital Collection

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Relations Between Effort Estimates, Skill Indicators, and Measured Programming Skill, Magne Jørgensen, Gunnar Bergersen, Knut Liestøl, Transactions on Software Engineering, IEEE

Finite element simulation of ionic electrodiffusion in cellular geometries, Ada Johanne Ellingsrud, Andreas Solbraa, Gaute T. Einevoll, Geir Halnes, Marie E. Rognes, Frontiers in Neuroinformatics, vol. 14, pp. 11, Frontiers

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An empirically evaluated checklist for surveys in software engineering, Jefferson Seide Molléri, Kai Petersen, Emilia Mendes, Information and Software Technology, vol. 119, pp. 106240, Elsevier

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Multisite pacing and myocardial scars: a computational study, Mohammad Albatat, Jacob Bergsland, Hermenegild Arevalo, Hans Henrik Odland, Samuel Wall, Joakim Sundnes, Ilangko Balasingham, Computer Methods in Biomechanics and Biomedical Engineering, vol. 23, Issue: 6, Taylor and Francis

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Deep Learning for Test Case Prioritization in Continuous Integration Testing, Aizaz Sharif, Dusica Marijan, Arnaud Gotlieb , Simula Research Laboratory

PhD theses

Software Testing in Continuous Integration with Machine Learning and Constraint Optimization, Helge Spieker, University of Oslo

Model-based function learning in high dimensions, Timo Klock, University of Oslo

Hard Mathematical Problems in Cryptography and Coding Theory, Srimathi Varadharajan, University of Bergen

Multilevel Monte Carlo methods for uncertainty quantification in brain simulations, Matteo Croci, University of Oxford

A computationally-assisted approach to extracellular neural electrophysiology with multi-electrode arrays, Alessio Paolo Buccino, University of Oslo

The PGAS Programming Model and Mesh Based Computation: an HPC Challenge, Jérémie Lagravière, University of Oslo

Shape Optimization for Finite Element Methods, Jørgen Schartum Dokken, University of Oslo

A computational study of Atrial Fibrillation mechanisms at the cardiomyocyte level, Marcia Vagos, University of Oslo

Talks

Cyber Nationalism: What Team Are You On?, Olav Lysne, Dan Geer, Dale Peterson, Miami Beach, Florida

Krav til samhandling i en teknologisk tid, Olav Lysne, Raddisson Plaza, Oslo, Norway

Digitale verdikjeder - Huawei og Digitalt Grenseforsvar, Olav Lysne, Thales meeting, Gamle Logen, Oslo, Norway

Digitalt Grenseforsvar og Digitale Verdikjeder, Olav Lysne, Etterretningshøgskolen

Easily Setting up 4G/5G Testbeds with OpenAirInterface using OSM, Thomas Dreibholz, Madrid/Spain, ETSI, OSM Hackfest, Madrid/Spain

Specifying Uncertainty in Use Case Models, Shaukat Ali, Tao Yue INSTICC, International Conference on Model-Driven Engineering and Software Development (MODELSWARD 2020)

Handling Uncertainties in Cyber-Physical Systems during TheirOperations with Digital Twins, Shaukat Ali, Tao Yue, 5th Workshop on Monitoring and Testing of Cyber-Physical Systems (MT-CPS)

Modeling Foundations for Executable Model-Based Testing of Self-Healing Cyber-Physical Systems, Tao Ma, Shaukat Ali, Tao Yue, IEEE International Conference on Software Testing, Verification and Validation (ICST 2020)

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Testing Quantum Programs, Shaukat Ali , Oslo Metropolitan University, Oslo, Norway

The mechanisms behind perivascular fluid flow, Vegard Vinje, 2nd Oslo Brainphatics Seminar, Fornebu, Norway

Digitale Verdikjeder, Olav Lysne, Experis, Oslo, Norway

Smittestopp, Olav Lysne, Stortinget, Norway

Smittestopp, Olav Lysne, Teknologirådet, Norway

Teknologiutvikling, rikets sikkerhet og samfunnssikkerhet, Olav Lysne, Forsvarssjefens ledergruppe

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Utvikling og teknologiske veivalg i en krisesituasjon, Olav Lysne, Åpent seminar om smittesporing, Fornebu, Norway

Cyberangrep som del av gråsoneangrep mot norske interesser, Olav Lysne, Fagdag, Langtidsplan for politi, PST og påtalemyndigheten

Etterretning, politikk og samfunn, Olav Lysne, Forsvarets Høgskole, Norway

Justissektoren, teknologi og myndighetsstrategi, Olav Lysne, Justisdepartementet, Norway

AI4EU: Pilot Experiments with the platform, Arnaud Gotlieb, Big Data Value Forum, Nov. 3-5, Berlin, Germany

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Managing Tailor-Made Enhanced Packet Cores for 4G/5G Testbeds in OSM with the SimulaMet OpenAirInterface VNF, Thomas Dreibholz, Andrés Felipe Ocampo, OSM Hackfest (Online)

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Fake News, Networks, and Natural Language Processing Tools, Johannes Langguth, Oslo (virtual)

Multi Modal Data Mining using Coupled Matrix/Tensor Factorizations, Evrim Acar Ataman, Tufts University – TRIPODS Seminar (virtual)

Requirements collection for the AI4EU platform development, Dusica Marijan, Big Data Value Forum, 3-5 November, Berlin, Germany

Multiscale modelling determines mechanisms of action for 2'-deoxy-ATP, a myosin activating therapeutic for heart failure, Kimberly J. McCabe, Yasser Aboelkassem, Abigail Teitgen, Michael Regnier, Andrew D. McCulloch VPH 2020, VPH 2020, Paris, France (Virtual)

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Improved Testing of AI-Based Anomaly Detection Systems Using Synthetic Surveillance Data, Aymeric Cretin, Alexendre Vernotte, Antoine Chevrot, Fabien Peureux, Bruno Legeard, Pierre Bernabé, OpenSky Symposium

On parallel simulation of porous media flow, Xing Cai, Schlumberger Eureka Applied Math Special Interest Group Meeting

The brain's numerical waterscape, Marie E. Rognes, Oxford Industrial and Applied Mathematics Seminar, Oxford, UK

The brain's (numerical) waterscape, Marie E. Rognes, Springer Partial Differential Equations and Applications webinar

Posters

Efficient simulations of patient-specific electrical heart activity on the DGX-2, Kristian Gregorius Hustad, Xing Cai, Johannes Langguth, Hermenegild Arevalo, GPU Technology Conference (GTC) 2020, Silicon Valley, USA, Nvidia

Big data is not always better – prediction of live birth using machine learning on time-lapse videos of human embryos, Steven Hicks, Trine B. Haugen, Mario Iliceto, Hugo Lewi Hammer, Jorunn M. Andersen, Oliwia Witczak, Michael Riegler, Mette Stensen, ESHRE virtual 36th Annual Meeting, ESHRE

Graph Structure Based Monitoring of Digital Wildfires, Johannes Langguth, Daniel Thilo Schroeder, Konstantin Pogorelov, Petra Filkukova, 6th International Conference on Computational Social Science, Boston, MA, USA

Adaptivity of Relu Nets Beyond Low-Dimensional Domains, Timo Klock, Alexander Cloninger, DeepMath 2020

Detection of False Data Injection in AIS Vessels Communication Using Machine Learning, Pierre Bernabé, Arnaud Gotlieb, Bruno Legeard, FEMTO-ST Institute, Besancon, France

Towards detailed Organ-Scale Simulations in Cardiac Electrophysiology, Johannes Langguth, Namit Gaur, Hermenegild Arevalo, Chad Jarvis, Neringa Altanaite, Qiang Lan, Xing Cai, GPU Technology Conference (GTC), Silicon Valley, San Jose, USA

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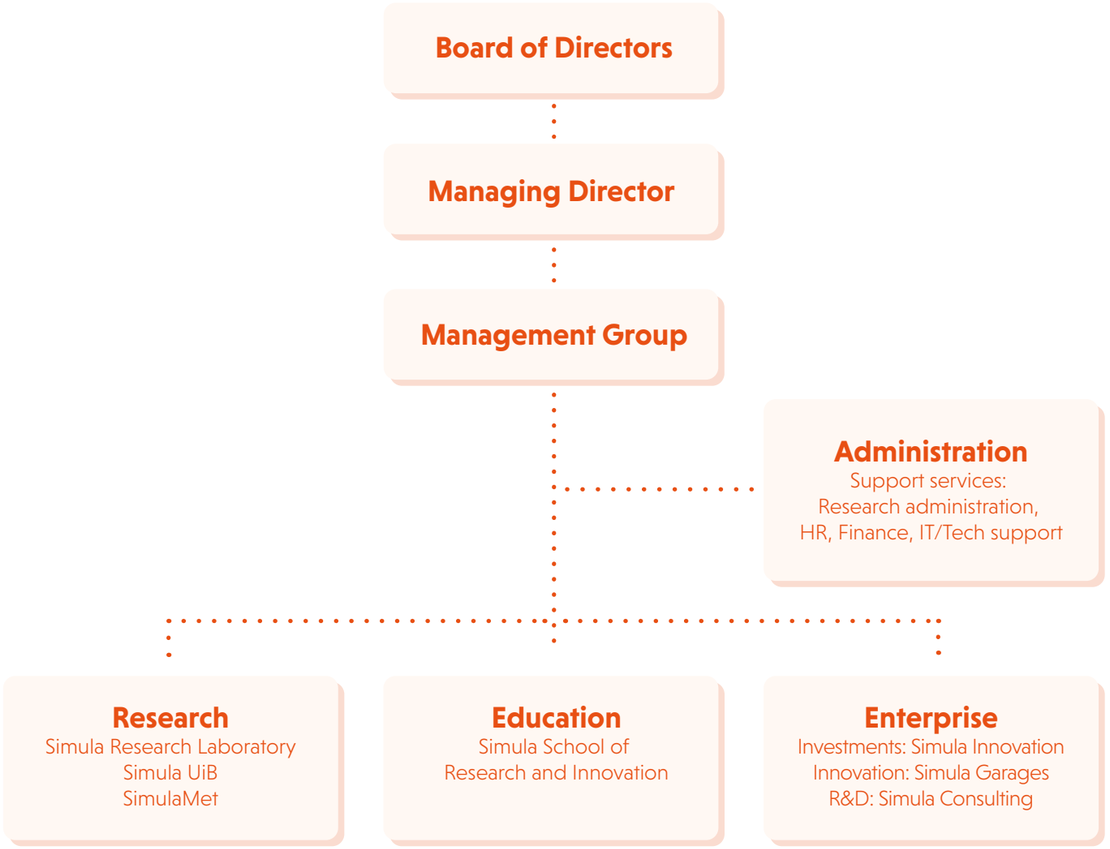
Public Outreach

Kan du ikke stole på leverandøren, er du sjakk matt, Olav Lysne Intervju, Dagens Næringsliv

Snart kommer 5G-nettet, Olav Lysne Studio2, NRK P2

Storebror og overvåkning - Podcast, Olav Lysne, Dobbeltklikk, Teknisk Ukeblad

Organizational structure



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