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[simula . research laboratory]

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Simula Research Laboratory was established January 1, 2001, in the aftermath of a political process aiming at deciding what should happen to Fornebu after the national airport was closed down. The political process resulted in establishing an information technology (IT) centre and, along with that, the government decided to establish a lab for the purpose of conducting research in IT. The Research Council of Norway organised a procedure for choosing three research groups to define the core of the lab; these groups can still be identified at Simula as the departments of Networks and Distributed Systems, Scientific Computing, and Software Engineering.

Now, after the first eight years, Simula has expanded in many ways. In 2001 the total expenses of the lab were about 24 MNOK and in 2009 this figure will approach 110 MNOK. This growth has included a substantial strengthening of the original research departments. In addition, we formed Simula Innovation, a company designed to create businesses based on the research activities in Simula; Kalkulo, a company that delivers technical consultancy in Simula's field of competence; and Simula School of Research and Innovation[1], which facilitates the education of PhDs and post-doctoral students in collaboration with Norwegian universities.

In the process of establishing Simula there were basically two constraints: The lab should be located at Fornebu and it should perform research in IT. Aside from these two basic limitations, Simula was to a large degree left to decide its own goals and its own organisational model. Indeed, we felt that we had an opportunity to do whatever we thought would produce best possible results. We were certainly happy about this large degree of freedom but we also realised the high risk and the fact that we would also have to answer for poor results. We did not ask for further political signals; rather, we grasped the opportunity and decided that we wanted to create something new: We created the Simula model. The main elements of this model are as follows.

Professor Aslak Tveito, Managing Director

THE SIMULA MODEL

1. Organisational model

The organisational and management models used in the Norwegian research system can basically be divided into the university model and the company model. Research institutes in Norway employ the latter. We strongly favoured the company model, as it appeared to be much clearer, more transparent, and easier to comprehend. Simula is thus managed more or less like a commercial company, with the prominent exception that commercial companies are set up to produce revenues, whereas Simula is constructed to produce research results, educate researchers, and enable innovations. Specifically, Simula is managed according to the Limited Company Act.

2. Full-time researchers

At Norwegian universities the teaching and supervising duties are rather severe. On the other hand, at Norwegian research institutes most researchers have to spend a large part of their time trying to obtain funding from industry. Based on the financial freedom that came with Simula, we wanted to establish a situation where highly skilled researchers were allowed to focus more or less exclusively on research; we wanted to revive the full-time researcher.

[1] *Simula School of Research and Innovation is owned by Simula (56%), StatoilHydro (21%), Bærum Municipality (14%), Telenor (7%), Sintef (1%), and Norwegian Computing Center (1%).*

3. The recruitment process

A research lab is as good as the researchers employed there. Therefore it is impossible to exaggerate the importance of a sound recruitment policy. As a part of that, efficiency is crucial; we need to be able to move forward very quickly when a unique opportunity arises. At Simula, we try to recruit extremely promising candidates and the best researchers will be given funds to build their own activity. The recruitment process aims at setting up a truly international lab and whenever possible we try to achieve gender balance.

4. Directed research [2]

We never subscribed to the view that excellent research can only be performed when each individual researcher is completely free to follow his or hers individual ideas. Rather, we wanted a model where we could determine a set of long-term goals and collectively work towards these in an organised manner. The research at Simula addresses fundamental problems, but the research is directed more or less as if the activity were organised in a private company. The freedom in day-to-day or week-to-week assignments is very great but the long-term goals are decided in a comprehensive process and everyone has to adapt to these goals. In particular, we have derived a careful procedure of initiating new projects.

5. Usefulness

The aim of basic research is rarely to be of use in the short term; indeed, it is widely acknowledged that deep knowledge ultimately is useful but that the path from science to application may be very long. At Simula we address research questions whose solutions would be applicable; that is, we do not pursue strictly curiosity-driven projects. Generally speaking, we address problems where the likelihood for important applications of a positive result is high.

6. Concentration

Diffusion is a natural process that moves a substrate from an area of high concentration to a region of low concentration. The process is extremely strong and affects many parts of life. Given a substantial amount of money, there are very strong mechanisms trying to spread these resources over a large number of worthy assignments. At Simula we have tried very hard to maintain focus on core issues and avoid the diffusion of resources.

7. Collaboration with industry

Since we want to deliver applicable results, we seek strong collaborations with industry at large. Such collaborations, however, must be long-term and directed towards really challenging problems; short-term consulting should be completely avoided at Simula. Furthermore, our aim is to educate PhDs and post-doctoral candidates with a firm grasp of the problems of industrial interest in their field of research.

8. Creating new businesses

Since real-life applications are the long-term goal for our research, Simula consistently aims at aiding researchers to enable the application of their research efforts.

9. A characteristic culture

We wanted to create a strong and characteristic research culture based on a few governing principles accepted by everyone, enabling efficiency, quality, excellent results, and a very good working atmosphere.

The present version of Simula is based on these building blocks. Of course, none of these parts are unique to Simula, but at least in Norway their combination has apparently not been tried before. Clearly, some of these elements are rather ambitious and we do not claim to have reached good solutions at every point. Note, however, that creating Simula was founded on very strong ambitions and the determination to create an excellent lab. Has this been successful? I would be the last person to answer that question but this year we will have some of the answer. The Research Council of Norway will evaluate Simula in 2009 from both a scientific and an organisational perspective. The motivation of the latter is to find improvements and consider whether the Simula model can be used by the Research Council to create new labs in other fields. For Simula the opportunity of having a sister or a brother in the Norwegian research system is, of course, most appealing.

[2] *In OECD terms, our research can be classified either as oriented basic research, which is defined to be research carried out with the expectation that it will produce a broad base of knowledge likely to form the background to the solution of recognised or expected current or future problems or possibilities, or as applied research, which is defined to be an original investigation undertaken in order to acquire new knowledge directed primarily towards a specific practical aim or objective (see http://stats.oecd.org/glossary).*

Simula Research Laboratory (Simula) consolidated its position in 2008, taking steps to further entrench important new programmes introduced in 2007 and preparing for another expansive year in 2009. When it was founded in 2001, Simula had a small staff and three research departments. Over the years, the organisation has turned into a corporation with three subsidiaries: Simula Innovation was established in 2004, Kalkulo in 2006 and the Simula School of Research and Innovation in 2007. Simula is located at IT-Fornebu in Bærum Municipality.

This rapid growth has engendered a need to update Simula's organisational structure. Accordingly, as from 1 January 2008, Simula introduced a new structure based on three main units: Basic Research, Research Education and Research Applications. Olav Lysne, Kristin Vinje and Ottar Hovind were appinted directors with responsibility for the respective units. The restructuring implied simplification and economisation, providing a sound platform for the Centre's further development.

Following restructuring, the Basic Research Division consists of three research departments: Scientific Computing, Networks and Distributed Systems, and Software Engineering. Carsten Griwodz was appointed head of the Networks and Distributed Systems Department as from 1 January 2008. The administration was reinforced during the year when Åsmund Ødegård was appointed Assistant Director of Administration.

An independent consultant carried out an evaluation of the organisation and management in 2008, confirming that Simula generally has a good reputation. Simula has been innovative and is considered successful, and managers and co-workers alike are proud to work here. The evaluation also showed that there is a need to place more emphasis on professionalisation of the role of manager and to devote more attention to preserving and cultivating Simula's distinctive corporate culture. A leadership training programme will be established in 2009.

Simula was last evaluated in 2004, and a new evaluation is scheduled in 2009. The Board is pleased that the preparations for this evaluation began in 2008, and it has a good dialogue with the Research Council.

In 2008, the Board adopted new guidelines for conflict management. One basic tenet is that conflicts should insofar as possible be dealt with at an early stage and at the lowest possible level. A new Code of Conduct for Personnel and Procedures for Internal Control were also adopted.

Simula's lease will expire at year-end 2010; after that, there are no political constraints on where the centre should to be located.

CONSOLIDATION IN PREPARATION FOR FURTHER EXPANSION

The Board has asked the administration to make a broad-based search for possible future premises.

Making scientific headway

Simula has continued to maintain a high level of research in 2008 in terms of quantity as well as quality. Four doctorates were completed in collaboration with the University of Oslo (UiO). The number of scholarly publications indicates that the institute is doing exceptionally well on the international arena. The Board of Directors appreciates that the eminent Dutch researcher Kirsten ten Tusscher joined Simula in June to head a new research group associated with the Institute's heart project.

Are Magnus Bruaset was named Simula's "Researcher of the Year" in 2008 for his outstanding efforts as head of the project Computational GeoSciences in close cooperation with StatoilHydro ASA, the Norwegian petroleum and industrial corporation. At the outset in 2004, it was almost unheard of for a Norwegian enterprise to provide so much support for basic research. Now, the budget has tripled, and cooperation with StatoilHydro and the project's results have been excellent.

The research project Sunrise was set up in 2008 as a collaborative effort between Simula and Sun Microsystems. The project is to perform fundamental research on networks and high performance data processing. Among other things, the project is to finance one post-doctoral research fellow and two PhD students. Total project costs are estimated at MNOK 7, and will be divided equally between Simula and Sun.

The major research projects Mango and Verdione also commenced in 2008. The larger, Verdione, is one of just four large-scale ICT projects supported by the Research Council of Norway. Verdione is a consortium project between the University of Tromsø, the University of Oslo, Telenor ASA and Lividi AS, focusing on the development of resilient video processing and reliable network support. The project will finance two post-doctoral research fellows and seven PhD students.

The Simula researchers Erik Arisholm, Xing Cai, Carsten Griwodz and Tor Skeie were promoted from associate professors to professors in 2008. All are affiliated with the University of Oslo, which is responsible for their appointments.

Society and dialogue

In 2008, the Centre has been deeply engaged in activities based on dialogue and public relations. Simula's annual dialogue meeting with the State was once again constructive and exciting. One important topic was that Simula's basic subsidy has not increased for six years. This matter was also broached in a letter to the three funding ministries. Compensation for salary and price trends is profoundly important for maintaining the Institute's distinctive nature. The Board has asked the State to increase funding so that the capacity for PhD students in collaboration with University of Oslo can be increased to 15 each year, as per the original plans. Simula's social responsibility was also a key topic at the meeting.

"Impressive!" remarked Minister of Transport and Communications Liv Signe Navarsete when she severed Simula's network cable without losing the picture.
Photo: Tore Guriby, Budstikka

The way Simula combines research and education with industrial collaboration is impressive.

Minister of Transport and Communications Liv Signe Navarsete visited Simula in February and was briefed on the preliminary results of the research project on Resilient Networking. Effective rerouting techniques were demonstrated when the Minister severed a network cable being used for video streaming. The Minister was deeply impressed when the video signal immediately found a new path, with nary a flicker on the screen.

Minister of Research and Higher Education Tora Aasland visited Simula in June and was given a general presentation. "The way Simula combines research and education with industrial collaboration is impressive", remarked Aasland.

The Labour Party fraction of the parliamentary Standing Committee on Finance also visited Simula in 2008. In early March, the Ministry of Education and Research organised an OECD conference in Oslo on research and innovation, taking advantage of the opportunity to showcase Simula to about 30 extremely competent research bureaucrats from all over the world. Rector Geir Ellingsrud of the University of Oslo also called on Simula in 2008.

Minister of Research and Higher Education Tora Aasland was impressed by Simula's research and education work in collaboration with business and industry.
L. to r.: Kristin Vinje, Tora Aasland and Aslak Tveito. In the background: The minister's political adviser Kyrre Lekve.

Simula Innovation AS

Simula Innovation AS saw burgeoning activity in 2008, especially with a view to networks and distributed systems. Two companies were founded and a new partnership was built up with Telenor ASA.

Lividi, the research project that has developed software for adaptive video streaming, received support from the Research Council of Norway's commercialisation programme FORNY in 2007. The project was commercialised in 2008, and the enterprise Lividi AS now has three full-time employees. The enterprise was also accorded Simula Innovation's Innovation Prize for 2008.

The Simula project on the development of resilient networks was also commercialised in 2008 through the establishment of the enterprise Resiliens AS.

SimTel Innovation is a wide-ranging partnership between Simula, Simula Innovation AS and Telenor R&D. The project was instituted in the latter half of 2007 and was made fully operational in 2008 with the hiring of three students and a project manager. SimTel focuses on fields of research with a high potential for innovation and commercialisation in the areas of telecommunications, information technology and media.

Both Lividi AS and Resiliens AS received internationalisation grants in 2008 from the business community's foundation for internationalisation NORINT. Three of Simula Innovation's commercialised and partially-owned enterprises reached the semi-finals in the competition for an Innovation Prize awarded by DnB NOR, Norway's largest banking and financial group.

Audun Fosselie Hansen was appointed the new director of Simula Innovation, joining the company at year end 2008.

The Simula School

The Simula School of Research and Innovation AS (the Simula School) was formally established in 2007. The goal is to educate masters and doctoral students in areas of industrial relevance in collaboration with industrial players and the University of Oslo, which will award the degrees.

The Simula School introduced several new projects in 2008, and the number of students and employees increased. As of 1 January 2008, the employment contracts of the faculty in the parent company Simula Research Laboratory were transferred to the Simula School.

The Simula School has experienced growing interest on the part of its partners StatoilHydro ASA and Telenor ASA during the year, and it is in the process of establishing new collaborative constellations. A pilot project was run in collaboration with Det Norske Veritas (DnV) to identify possible common areas of interest, and DnV has been invited to help educate students.

Simula's relations with Bærum Municipality continue to be exceptionally good. The municipality would like to make a science centre at Fornebu and has invited the head of the Simula School to take a seat on the steering group that will be running the project. One initiative that has been exceptionally well received was when pupils at Valler Upper Secondary School were invited to Simula, where they can get help to prepare for their mid-terms and examinations in mathematics and physics. Simula considers the initiative a link in the efforts to enhance recruitment to maths and science studies.

Kalkulo AS

Established in 2006, Kalkulo AS delivers technical software based on mathematics, geometry and visualisation. In 2007, a significant share of Kalkulo was conveyed to the company World Beside AS, so that the remainder of Kalkulo began 2008 at a slower pace. During the year, Kalkulo experienced substantial new growth, increasing from four to nine employees.

The comprehensive joint Computational Geosciences project with Norsk Hydro, which aims at developing a better understanding of the processes that are important for the development of hydrocarbon deposits, was carried out and expanded in 2008.

Several new projects were also initiated. Kalkulo has established collaboration with the enterprise Insilicomed of the US, in which Simula Innovation is also a co-owner. Kalkulo also works with the Simula research group Inverse Problems (IP) on a project whose goal is to investigate how computational methods can be used to diagnose the scope and location of heart attacks and cardiovascular diseases. A pilot project has been initiated with the state-owned power company Statkraft, which would like to make a tool for visualisation and quality control measurements of rainfall and temperature.

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Hiring and gender equality

At the end of 2008, Simula had 41 full-time employees and 19 on part-time and in secondary positions, bringing the total staff to 60 individuals. Of that number, 49 were men and 11 were women, while 47 were Norwegian and 13 were foreign nationals.

The Simula Group had a total of 118 employees at year-end, 20 of whom were women and 36 of whom were foreigners. Four staff members have Norwegian universities as their main employers, but they have their workplace at Simula.

Simula takes gender equality considerations when hiring and works continuously to raise the percentage of women. Absence due to illness is extremely low throughout the Simula Group. No work-related illnesses or accidents were reported during the year.

The managers of the Simula Group took an HSE course in 2007, following it up in 2008. A review of Simula's HSE efforts indicates that they are organised in accordance with current regulations, and that the main procedures are documented and followed up in actual practice.

The Board confirms that 2008 was a year of consolidation that has improved the platform on which we can build continued strong development

Financial affairs

Simula's aggregate operating revenues in 2008 came to MNOK 71.8. External project financing totalled MNOK 22.8. The net profit/loss for the year was a deficit of NOK -2 733 778, which was transferred to other equity.

The Simula Group's total operating revenues added up to MNOK 93.7 in 2008, bringing the net profit/loss for the year to MNOK -3.1, after minority interests.

The Simula School's aggregate operating revenues were MNOK 24.1 and the deficit for 2008 was of MNOK -1.8.

Kalkulo AS reported total sales revenue of MNOK 7 in 2008. Earnings before tax came to MNOK 1.1.

Revenues for Simula Innovation AS totalled MNOK 17.2, leaving a deficit of MNOK -0.47. Kalkulo AS provided a Group contribution to Simula Innovation AS of MNOK 1.1 in 2008.

The going concern assumption applies and is the basis for the annual accounts. The company has a satisfactory operating structure. No situation has arisen since year end that has a material impact on the accounts as presented.

Environmental issues

Simula's activities do not pollute the outdoor environment.

Prospects for the future

The Board confirms that 2008 was a year of consolidation that has improved the platform on which we can build continued strong development. As regards the outlook for the future, the evaluation of Simula to be performed in 2009 will be important, and the Board looks forward to seeing how the funding ministries will follow it up. Simula's Board of Directors has had a total of 30 items on its agenda. The Board of Directors are very pleased with the activity at Simula, and would like to express its sincere gratitude to all employees for their dedicated efforts over the past year.

2007	2008	INCOME STATEMENT	Note	2008	2007
	GROUP		Note	PARENT COMPANY	
91 183 153	93 727 791	OPERATING REVENUES	6	71 785 384	69 234 480
		OPERATING EXPENSES			
57 127 339	68 135 277	Cost of labour	5	50 297 226	45 199 347
1 692 578	2 140 790	Ordinary depreciation	3	2 085 340	1 647 718
26 957 815	28 641 468	Other operating expenses	5, 14	23 126 175	22 822 645
85 777 732	98 917 535	TOTAL OPERATING EXPENSES		75 508 741	69 669 710
5 405 421	-5 189 744	OPERATING PROFIT		-3 723 357	-435 230
		FINANCIAL ITEMS			
834 921	1 324 087	Other interest income		1 006 023	671 682
35 346	47 307	Other financial income		16 056	9 141
5 360	3 949	Other interest expenses		2 882	1 431
241 764	47 309	Other financial expenses		29 618	12 487
623 143	1 320 136	RESULT OF FINANCIAL ITEMS		989 579	666 905
6 028 564	-3 869 608	PROFIT BEFORE TAXES		-2 733 778	231 675
759 360	692	TAXES FOR THE YEAR		-	-
5 269 204	-3 870 300	NET PROFIT		-2 733 778	231 675
1 006 586	-797 214	Minority Interests		0	0
4 262 618	-3 073 086	RESULTS AFTER MINORITY INTERESTS		-2 733 778	231 675
		TRANSFERS			
		Transferred to equity		-2 733 778	231 675
				-2 733 778	231 675

2007	2008	BALANCE SHEET	Note	2008	2007
	GROUP			PARENT COMPANY	
		TANGIBLE FIXED ASSETS			
		Fixed assets			
3 692 547	4 134 605	Furniture, equipment, etc.	3	4 016 044	3 651 731
3 692 547	4 134 605	Total fixed assets		4 016 044	3 651 731
		Financial fixed assets			
1 205 972	2 445 900	Investments in shares	12	-	-
-	-	Intra-Group loans	11	-	300 000
-	-	Investments in subsidiaries	10	5 319 700	5 319 700
1 205 972	2 445 900	Total financial fixed assets		5 319 700	5 619 700
4 898 519	6 580 505	TOTAL FIXED ASSETS		9 335 744	9 271 431
		CURRENT ASSETS			
		Receiveables			
7 579 359	5 921 432	Accounts receivable		2 704 287	4 377 773
6 863 615	5 279 274	Other receiveables		4 122 220	4 162 177
14 442 974	11 200 706	Total receivables		6 826 507	8 539 950
15 262 989	15 687 502	Bank deposits	9	8 865 625	5 088 565
29 705 963	26 888 208	TOTAL CURRENT ASSETS		15 692 132	13 628 515
34 604 482	33 468 713	TOTAL ASSETS		25 027 876	22 899 946
		EQUITY			
		Paid-in equity			
1 500 000	1 500 000	Share capital	7,8	1 500 000	1 500 000
1 500 000	1 500 000	Total paid-in capital		1 500 000	1 500 000
		Earned equity			
9 838 013	6 764 927	Other equity	8	3 754 523	6 488 301
2 559 393	1 762 179	Minority Interests	8	0	0
12 397 406	8 527 106	Total earned equity		3 754 523	6 488 301
13 897 406	10 027 106	TOTAL EQUITY		5 254 523	7 988 301
		LIABILITIES			
		Short-term liabilities			
5 743 936	4 894 847	Accounts payable		9 234 459	4 666 313
759 360	692	Tax payable	13	0	0
5 710 392	5 843 950	Duties payable		2 569 674	3 795 185
8 493 388	12 702 118	Other short-term liabilities		7 969 220	6 450 147
20 707 076	23 441 607	Total short-term liabilities		19 773 353	14 911 645
20 707 076	23 441 607	TOTAL LIABILITIES		19 773 353	14 911 645
34 604 482	33 468 713	TOTAL EQUITY AND LIABILITIES		25 027 876	22 899 946

Note 1 – Accounting principles

The financial statements have been prepared pursuant to the regulations in the Norwegian Accounting Act of 1998. The statements have been drawn up in accordance with Norwegian accounting standards.

The main rule for the valuation and classification of assets and liabilities

Assets intended for permanent ownership or use are classified as tangible fixed assets. Other assets are classified as current assets. Receivables to be paid back within one year are always classified as current assets. The same criteria are applied to the classification of short- and long-term liabilities.

Fixed assets are valued at acquisition cost, but written down to their fair value if the reduction in value is believed to be of a permanent nature. Fixed assets are depreciated systematically over the useful life of the asset. Long-term liabilities are recognised at their nominal values on the date the debt was incurred. Long-term liabilities are not revalued to fair value in response to interest rate fluctuations.

Current assets are valued at cost or fair value, whichever is lower. Current liabilities are recognised at their nominal values on the date the debts were incurred. Current liabilities are not revalued to fair values in response to interest rate fluctuations.

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

Foreign currencies

Assets and liabilities in foreign currencies are translated into Norwegian kroner at the mid-rates quoted by Norges Bank on the day of balance sheet recognition.

Tangible fixed assets

Tangible fixed assets are generally depreciated over the expected useful life of the asset. Depreciation is generally distributed on a straight line basis over the expected useful life of the asset.

Receivables

Accounts receivable and other receivables are recorded at nominal amounts less provisions for anticipated losses on bad debts. Provisions for losses are based on individual assessments of the recoverability of each receivable. In addition, if necessary, a general provision is made for anticipated bad debts on other receivables.

Pensions

A straight line earning profile is used to account for pensions and assumptions are made regarding expected salary upon retirement.

Taxes

The company has no tax expenses since its activities are not considered taxable.

Note 2 – Financial market risk

The company has little exposure to financial market risk.

Note 3 – Fixed assets
Simula Research Laboratory AS

	Computer equipment	Furniture/fittings, equipment, etc.	Total
Acquisition cost at 1 Jan.	4 679 248	7 104 365	11 783 613
Acquired 2008	2 011 579	444 699	2 456 278
Disposals 2008	444 290	-	444 290
Acquisition cost at 31 Dec.	6 246 537	7 549 064	13 795 601
Acc. depreciation	4 012 813	5 766 744	9 779 557
Book value at 31 Dec.	2 233 724	1 782 320	4 016 044
Ordinary depreciation	948 929	1 136 411	2 085 340
Depreciation in %	20–50%	20–33%	

Simula Research Laboratory AS – Group

	Computer equipment	Furniture/fittings, equipment, etc.	Total
Acquisition cost at 1 Jan.	4 735 352	7 104 365	11 839 717
Acquisitions 2008	2 144 774	444 699	2 589 473
Disposals 2008	444 290	-	444 290
Acquisition cost at 31 Dec.	6 435 836	7 549 064	13 984 900
Acc. depreciation	4 083 551	5 766 744	9 850 295
Book value at 31 Dec.	2 352 285	1 782 320	4 134 605
Ordinary depreciation	1 004 379	1 136 411	2 140 790
Depreciation in %	20–50%	20–33%	

Note 4 – Pension costs

The Group has a pension plan that covers a total of 44 individuals in the parent company and 98 individuals in the Group. The pension plan provides defined future benefits. Pension benefits depend on the individual employee's number of years of service, salary level upon retirement age, and social security benefits. The collective pension agreement is funded by building up pension funds under the auspices of the Norwegian Public Service Pension Fund.

Note 5 – Cost of labour, number of employees, remuneration, etc.

	Simula Research Laboratory AS		Simula Research Laboratory AS Group	
Cost of labour	2008	2007	2008	2007
Wages	29 327 448	35 723 927	54 505 046	45 451 230
National insurance payment	4 311 686	5 462 471	8 249 427	6 910 740
Pension expenses	1 485 421	1 810 743	3 026 044	2 446 888
Other benefits	2 262 104	2 202 206	2 354 760	2 318 480
Contribution, cost of labour SSRI	12 910 568	-	-	-
Total	**50 297 226**	**45 199 347**	**68 135 277**	**57 127 339**
Average man-years of labour	43,5	65	92,3	81

Benefits to top management		
	Simula Research Laboratory AS	Simula Research Laboratory AS Group
Director	1 193 999	-
Other remuneration	172 167	-
Pension expenses, director	51 289	-
The Board of Directors	187 000	320 335
Auditor	53 000	103 900
Others auditing services	25 400	56 200

Note 6 – Operating revenue

	Simula Research Laboratory AS	Simula Research Laboratory AS Group
Research funding	49 000 000	55 000 000
Subsidies from the Research Council of Norway and the EU	19 458 751	19 903 834
Services for the subsidiary	-	-
Subsidies for research fellows	664 469	664 469
Other income	2 661 460	18 159 488

Note 7 – Share capital and ownership structure
The company's share capital consists of 1 000 shares with a nominal value of NOK 1 500 per share.
The shares are owned by:
The Norwegian state /repr. by the Ministry of Education and Research   80%
The Norwegian Computing Centre   10%
Sinvent AS   10%

Note 8 – Equity
Simula Research Laboratory AS

	Share capital	Other equity	Total equity
Equity at 1 Jan.	1 500 000	6 488 301	7 988 301
Net profit for the year	-	-2 733 778	-2 773 778
Equity at 31 Dec.	1 500 000	3 754 523	5 254 523

Simula Research Laboratory AS - Group

	Share capital	Other equity	Minority Interests	Total equity
Equity at 1 Jan.	1 500 000	9 838 013	2 559 393	13 897 406
Net profit for the year	-	-3 073 086	-797 214	-3 870 300
Equity at 31 Dec.	1 500 000	6 764 927	1 762 179	10 027 106

Note 9 – Bank deposits
The company had locked-in bank deposits of NOK 1 890 256 in connection with signed leases and
NOK 1 391 735 in restricted deposits relating to withholding taxes. The Group's tied-up withholding
tax aggregated NOK 2 547 072.

Note 10 – Subsidiaries

	Main office	Stake at 31 Dec.	Book Value	Company's equity at 31 Dec.	Company's profit/loss '08
Simula Innovation AS	Fornebu	100 %	4 356 300	3 350 452	-467 693
Kalkulo AS	Fornebu	100 %	406 000	2 760 408	822 978
SSRI* AS	Fornebu	55.74%	557 400	3 981 424	-1 801 207

Note 11 – Outstanding accounts/intra-Group transactions

	2008	2007
Claims against Simula Innovation AS	642 833	2 560 952
Debt to Simula Innovation AS	287 314	30 578
Long-term claims against Kalkulo AS	-	300 000
Short-term claims against Kalkulo AS	306 571	403 761
Debt to Kalkulo AS	87 074	-
Claims against SSRI AS	395 323	388 345
Debt to SSRI AS	5 287 569	254 540
Subidies to Simula Innovation AS	2 583 000	2 700 000
Subsidies to SSRI AS	12 910 568	-
Acquisition of services etc. to Simula Innovation AS	328 436	-
Acquisition of services etc. to Kalkulo AS	457 043	-
Acquisition of services etc. to SSRI AS	474 618	-
Sale of services etc. to Simula Innovation AS	1 055 501	5 526 858
Sale of services etc. to Kalkulo AS	1 096 636	606 038
Sale of services etc. to SSRI AS	1 476 996	444 843
Interest income from Kalkulo AS	5 250	14 250

Note 12 – Shares

	Number	Nominal value per share	Book Value
Insilicomed inc, USA	131 945	USD 1.80	1 220 755
Resiliens AS	49 900	1.0	52 894
World Besides AS	40 000	1.0	40 000
Symphonical AS	545 528	0.10	1 095 150
Lividi AS	35 000	1.0	37 100
			2 445 900

Simula School of Research and Innovation

Note 13 – Tax

Simula Research Laboratory AS does not engage in taxable activities. The subsidiary Simula School of Research and Innovation AS does not engage in taxable activities. The subsidiaries Simula Innovation AS and Kalkulo AS are liable to taxation. Simula Innovation AS carried forward a deficit of NOK 840 133.

Taxation for the year consists of:

Tax payable	692
Net total taxes	**692**

Tax payable for the year is calculated as follows:

Earnings before tax (EBT) – Kalkulo AS	1 133 070
Group contribution paid	-1 105 000
Permanent differences	-1 975
Change in temporary differences	-23 622
Base tax payable	2 473
Tax payable on the profit for the year	**692**

Note 14 – Leases

The company has signed leases for four photocopiers. The leases will all expire in 2013. The company also has three leases for coffee machines and an agreement for car leasing. NOK 420 982 were expensed for these leases in 2008.

Cash flow statement

Simula Research Laboratory AS Group			Simula Research Laboratory AS	
2007	**2008**		**2008**	**2007**
		Cash flow from operating activities:		
5 269 204	-3 870 300	Net profit for the year	-2 733 778	231 675
1 692 578	2 140 790	Depreciation expense	2 085 340	1 647 718
205 999	-	Write downs on share investments		-
-6 494 851	3 242 268	Change in receivables	1 713 442	-1 714 891
7 634 791	2 734 531	Change in short-term liabilities	4 861 708	3 456 724
8 307 721	4 247 289	Net cash flow from operating activities	5 926 712	3 621 226
		Cash flow from investing activities:		
-2 494 424	-2 582 847	Investments in production equipment, net	-2 449 652	- 2 437 858
-15 003	-1 239 928	Investments in shares	-	-557 400
-2 509 427	-3 822 775	Net cash flow from investing activities	-2 449 652	-2 995 258
		Cash flow from financing activities:		
2 950 975	-	Contributed equity	-	-
-	-	Change, long-term receivables	300 000	300 000
2 950 975	-	Net cash flow from financing activities	300 000	300 000
8 749 269	424 514	Net cash flow for the period	3 777 060	925 967
6 513 720	15 262 989	Cash reserves, 1 January	5 088 565	4 162 598
15 262 989	15 687 502	Cash reserves, 31 December	8 865 625	5 088 565

> At the beginning of 2008 Simula Research Laboratory was reorganized and Simula Basic Research emerged as a dedicated unit focusing on the research activities of the centre.

Simula's aim is to conduct long-term basic research with a clear view to applying the research results. This apparently paradoxical statement needs some explanation. Projects at Simula work on fundamental, complex problems that will remain a challenge for a long time. In that respect what we do is basic research. Still, all projects at Simula should be such that the potential impact of the research results is high. They should study problems that are considered important, not only by the research community but also by society at large.

Potential impact is, however, not enough, as there are plenty of examples of very good research results that never got their potential released. At Simula, we strive to maintain a culture where each project and each researcher has a clear understanding of the processes that lead from new insight to its utilization in society. This does not mean that everyone should personally pursue opportunities for commercialization. In fact, the potential value for society of most results is better realized in other ways. It does, however, mean that at Basic Research we know that publishing new results in scientific papers, although an important goal in itself, is no guarantee that the value of these results will be exploited.

A good example of how we work is a software engineering project aptly named BEST. This project involves how to improve cost estimates of software development projects and better handle the uncertainty related to these estimates. In spite of the very applied nature of the problem formulation, this is a basic research problem that will remain a challenge in the foreseeable future. With regards to publications, this project is known to be one of the most productive in the world in software engineering. Equally important, BEST has established a practice of offering a series of very popular courses for practitioners in the IT industry. It is through these courses that BEST promotes the impact of its research results outside of academia.

**Professor
Olav Lysne,
Director of Basic
Research**

Another example is the project on interconnection networks in the Networks and Distributed Systems Department. This activity started in the early 2000s and focused on efficient and deadlock-free routing in arbitrary topologies. At the time, this was an unsolved problem with no present-day application. The research on interconnection networks therefore started by publishing results on network structures obtained by means of computer simulations. Currently, methods developed in this project are applied by the world's largest computers and the project has turned into an activity that now also researches routing architectures on real hardware in collaboration with Sun Microsystems.

Finally, the Scientific Computing Department has been conducting long-term research on modeling the electrical activity of the heart. At the outset this was pure, basic research that aimed to understand and model the creation and flow of electric signals through the human body. As research proceeded, a project spawned off that investi-

gates the extent to which the gained knowledge can be used to identify early stages of heart infarction from ECG recordings.

Although very different from one another, these projects have common traits. They all started by studying fundamental and complex problems with long-term horizons. At the outset the projects consisted merely of researchers who had strong potential to create excellent research results in due time and to publish these results in highly respected journals and conferences. When the results of the research appeared, the projects took the steps necessary to investigate and, when applicable, promote, the impact of these results. This is what basic research at Simula is about.

❝❞ Research drives new development and thrives on change, but change can be surprising and scary as well. The Networks and Distributed Systems Department (ND) certainly expected a phase of uncertainty at the beginning of 2008, when department leader Olav Lysne accepted the position of director of basic research for Simula and could no longer lead the department. We were glad to find out that ND projects that had been set in motion under his leadership were not disturbed too much and continued on a successful path. The ND department can proudly point out that industry takes our work seriously and that our cooperation is paying off.

While we enjoy the attention of industry due to past successes and will continue in these fields, our research topics must also evolve and new results and directions have sprung up in ND's research projects.

Some research directions of the Interconnection Networks project have seen successful milestones in the successful PhD defences of Frank Olaf Sem-Jacobsen and Nils Agne Nordbotten and resulted in the initiation of Sunrise. Besides these successes, new research directions have been initiated as well. One example is the identification of the role of interconnection networks in utility computing data centres.

Resilient Protocols And Internet Routing's favourite achievement is the insight that they have gained into the scalability problems of BGP, the routing protocol that puts the 'Inter' in Internet by determining the communication paths between networks. The group has found out that the way in which the Internet grows, specifically the neighbours that networks choose when they first connect to the Internet, creates a topology that poses scalability challenges due to the way in which BGP works. The group found that recent Internet standards are actually worsening the problems of routing inconsistencies.

Resource utilisation in time-dependent large-scale distributed systems has entered a new arena by using user studies of scalable video quality. Much existing research in the field of distributed systems is built on the promise that scalable video holds for adaptive streaming over unreliable networks to a variety of end-systems. There are a multitude of scaling options and the group has shown that existing models that are supposed to provide the best experience to users fail because the order in which the options need to be applied varies with the video content.

The Resilient Wireless Networks group has broadly entered the area of cognitive radio networks. Cognitive radio networks opens up the radio spectrum for secondary users when and where the main licensee is not using it. This new idea poses a multitude of challenges related to finding the unused spectrum and to its allocation and release. With several results to show, the group has explored new methods and new scientific cooperation and can report the development of a new admission control algorithm for cellular cognitive radio networks that uses power control in the maximisation of the cell owner's revenue while providing the best possible quality of service.

These highlights show the successful movement of ND's researchers in the ever-changing fields of networks and distributed systems. We are happy to see an increasing number of thematic connections between the department's research teams. These improve the mutual understanding that ND's researchers have of their fields and is already giving the department greater flexibility in the research methods that are applied. The groups aim towards including experimental research into their portfolio of methods, which will help us sustain successful research at a high international level, and publications at top venues show an ever-increasing demand for the experimental verification of research results. With these steps and many new faces, we look forward to future changes.

**Professor Carsten Griwodz,
Head of Networks and
Distributed Systems**

**Professor
Hans Petter Langtangen,
Head of Scientific Computing**

THE SCIENTIFIC COMPUTING DEPARTMENT

> The Scientific Computing Department has built a strong research record in numerical methods and software for partial differential equations, with a particular application to problems in biomedicine. A collaboration with Rikshospitalet HF aims at determining ischemia, a reversible precursor to heart infarction. Instead of employing the standard methods of contemporary medical research, we develop mathematical models and software for analysing ECG recordings and thereby identify whether a patient suffers from this disease. The focus in 2008 has been on validating the mathematical model against patient-specific measurements from Rikshospitalet HF. The results are promising, but many challenging unexplored issues must be investigated before the medical benefits of the methodology are clear.

Computing the electrical activity in the heart has a long tradition at Simula. An overall aim of the project is to develop an efficient simulator of the electromechanical function of the heart. Last year, improved numerical methods were developed, and we wrote a review paper on the numerical solution methods in this field. Two other fields of investigations were initiated. We developed a new framework for analyzing the resting state of models of cardiac tissue. Instabilities of the resting state are known to be a possible cause of arrhythmias. Furthermore, we developed a new method for computing advantageous properties of anti-arrhythmic drugs.

The Computational Geosciences project addresses fundamental challenges in oil and gas exploration and provides research results that help Statoil-Hydro maintain an internationally competitive edge. Together with StatoilHydro, Simula has developed two different technologies for the computer-based modeling of complicated geological structures on different spatial scales and over geological time. The associated software is now being disseminated to a wider user community inside StatoilHydro and among close partners. In 2008, we also conducted basic research on transport of sand particles in water, methods for achieving parallel scalability of software for simulating basin evolution, estimation of parameters in basic evolution models, and we explored methods for measuring stochastic uncertainty in simulation models.

Most of the efforts in 2008 were devoted to the continued build-up of our Norwegian Centre of Excellence, called the Center for Biomedical Computing (CBC). Over the last few years we built a strong collaboration with medical researchers at the University Hospital in Tromsø. Our flow simulations in combination with their research on aneurysm formation and rupture in a blood vessel system at the bottom of the brain (Circle of Willis) are already published in medical journals.

Another promising collaboration with a medical doctor, Professor Victor Haughton at the University of Wisconsin, aims at understanding the diagnosis and treatment of Chiari malformation, a pathological condition characterized by obstruction of the cerebrospinal fluid that pulsates between cranium and spine. This obstruction leads to abnormal pressure conditions in the brain and to the formation of cysts within the spinal cord. Patients develop severe motor and sensory dysfunctions and may eventually dia. Investigating abnormal flow patterns and their causes will improve our understanding of the condition, allowing better diagnosis and treatment to be carried out.

Our activity on developing robust numerical methods and software for flow simulations established a solver framework with a range of methods for incompressible, viscous flow (the Navier-Stokes equations). The purpose is to conduct an objective comparison of competing methods under different flow conditions. Progress was also made with developing a posteriori error estimates and adaptive methods for flow problems. For this latter topic, we experience a very fruitful collaboration with Professor Mats Larson and his group at Umeå University.

A key area of research and development at Simula has been software for partial differential equations. Our focus now is mainly on the FEniCS project, which aims at producing a new generation of software for finite element-based simulations. The FEniCS software now has about 500 downloads every month from people in over 70 countries.

" Our slogan is even more relevant and fitting today than it was when we began operating in 2001: The industry is our lab! The main goal of the Software Engineering (SE) department is to provide novel, practical, and cost-effective solutions to important, enduring, and challenging problems faced by our industrial partners. Technological innovation combined with carefully planned and conducted empirical studies now play important roles in maintaining our continued success.

The SE department places a strong emphasis on cooperating with, and transferring results to, the software industry. Since 2001, we have collaborated with approximately 300 companies, both national and international. The most common kind of collaboration is one in which a company provides software professionals as participants and receives feedback about the outcome of a study on which they work, but we also have many long-term industry collaborations, for example, with organizations, such as ABB, Telenor, and the Norwegian Tax Authoritiy. Such long-term collaborations are becoming increasingly critical to facilitate growth for funding streams and available resources, and to ensure that we produce research that makes a major impact on both the state-of-the-art and the state-of-practice.

Thus, in 2008, a considerable amount of effort was invested in establishing new, long-term industry-driven research projects, to be funded either by the companies themselves or by applying for funding for such collaborations through the Norwegian Research Council and the European Union (EU). Examples of successful applications thus far include the VERDE project (on verification-oriented and component-based model-driven engineering for real-time embedded systems) in collaboration with, amongst others, WesternGeco and SINTEF, and the InspectIT project (on assessing and improving the cost-effectiveness of automated software inspection). In anticipation of receiving national funding, we have also initiated a project on model-based testing of video-conferencing systems in collaboration with Tandberg. Furthermore, this particular project has been accepted as a Norwegian subconsortium within a European ITEA 2 project on the deployment of model-based technologies to industrial testing, called D-MINT. As a D-MINT partner, we contribute to the development and assessment of model-based testing approaches in a variety of domains, such as transportation, telecommunications, industrial engineering, manufacturing engineering, and financial services through an international consortium of 31 partners. Finally, we have been working on establishing a large-scale, strategic research alliance with Det Norske Veritas (DNV). The purpose of the joint research and development programme is to deliver novel, model-based

software engineering approaches for the development, verification, operation, and maintenance of software intensive control and monitoring systems in the maritime and energy sectors. At the time of this writing, an agreement has been reached, and contracts will be negotiated between Simula and DNV in 2009.

In terms of measuring scientific output, the SE department is ranked as number three (amongst 1,361 institutions worldwide) in the most recent assessment of both systems, and software engineering scholars and institutions. Two of the researchers of the department are among the top scholars (No 1 and No 4) in the corresponding ranking of individual researchers. Furthermore, scientific papers written by SE department engineers are frequently cited by other researchers, a number of which are consistently amongst the most often cited software engineering papers in recent years.

At the end of 2008, Stein Grimstad was appointed as the new head of the department, assuming the responsibility from Dag Sjøberg, who had managed this department since 2001.

We are proud of our achievements for 2008. The department has firmly established itself amongst the world leaders on the development and empirical evaluation of state-of-the-art software engineering practices and technologies in close collaboration with industry. We expect to continue our considerable growth in 2009, both in terms of human resources and research achievements with high industry impact.

Dr. Stein Grimstad,
Head of
Software Engineering

In an update of last year's Simula's organisational structure, the unit named Research Applications was set up as a framework to support the two subsidiaries Simula Innovation AS and Kalkulo AS. This organisation allows Simula's innovation work to be viewed in a larger perspective and to combine activities with a view to long-term planning and strategic priorities. With activities in the same business area, it is natural for these subsidiaries to comprise a single unit, promoting and facilitating the application of Simula's research results and providing a return on national investment.

**Ottar Hovind,
Director of Research
Applications**

Simula has proven that a strong focus on basic research can be successfully combined with long-term industrial collaboration. In such a collaboration Simula's role is to solve challenging problems that significantly benefit the industrial partner. Simula's major commercial activity today is rooted in the Scientific Computing (SC) department with the StatoilHydro collaboration. The scale of this collaboration has increased since it began in 2005 and our initial contact with StatoilHydro's oil and gas division has emerged as a long-term research collaboration in Computational Geosciences. The collaboration continues this year with increased strength and has a defined scope until at least 2014.

It is important to actively identify all business opportunities within the core of Simula's three research areas and in the field where a successful application is most likely. The volume of high-quality projects generated at Simula over the past years has been very good. Even though Simula has a certain volume of projects with market potential, the road to a commercial breakthrough is still long and does not necessarily lead to success in the current market. Simula Innovation needs to prioritise in order to use the resources within the framework of a growing portfolio, with relatively little internal funding. Closer collaboration with other commercialisation experts was put on the agenda in 2008, IT Fornebu being one of them.

An evaluation of the most successful and promising projects and spin-off companies so far shows that they each have their roots in the core activity of one of the research departments. Furthermore, researcher participation is key in commercialisation projects. Consequently the unit has engaged in building two career paths at Simula, both academically and commercially, and is currently evaluating different models that allow researchers a degree of flexibility to rejoin their research departments in case the start-up fails or becomes mature and independent of its founders.

Strategic collaboration with a major industry partner adds both expertise and financial strength and consequently increases the probability for a commercial breakthrough. The case of StatoilHydro has provided the SC department, and Simula as a whole, with very valuable experiences in how to develop a close industrial collaboration. The Research Applications unit will also work for and support the other two departments in their efforts for increased industry collaboration. At present, the Networks and Distributed department also has a very promising collaboration with industry, but on a smaller scale than the StatoilHydro case. This includes a project with Sun Microsystems and the SimTel project described below.

" The main purpose of Simula Innovation is to engage in innovation based on Simula's research. Furthermore, the company shall take decisions regarding the acquisition, ownership, and management of stakes in companies, in addition to managing Simula's other commercial interests.

Simula Innovation's level of activity in 2008 was good, especially within the areas of networks and distributed systems. Two companies were established and a collaborative project with Telenor ASA was initiated. The research project Lividi developed software for adaptive video streaming and in 2007 received funding from the Norwegian Research Council. In 2008, the project was commercialised and the company Lividi now has three full-time employees. Lividi also received the Simula Innovation Award for 2008. In addition, a Simula project focussing on developing resilient networks resulted in a commercial venture and the company Resiliens AS was established as a result in 2008.

As of 2009 Audun Fosselie Hansen is the new director of Simula Innovation. Hansen worked for Telenor R&I from 2001 to 2008. He worked on his PhD degree at Simula between 2003 and 2007 and co-founded the Simula Innovation spin-off Resiliens. As the project director of SimTel Innovation from 2007 to 2008, he formed and established the three research and innovation activities that are currently part of the Simula-Telenor collaboration.

Simula has proven that a strong focus on basic research can be combined successfully with a long-term industrial collaboration

SimTel Innovation is a major collaboration project between Simula Innovation and Telenor R&I. The project was initiated in the second half of 2007 and went into full operation in 2008, employing four PhD students and a project leader. SimTel is focussing on research areas with a large potential for innovation and commercialisation within telecommunications, information technology, and new media.

Both Lividi and Resiliens received scholarships for internationalisation in 2008 from Næringslivets Internasjonaliseringstiftelse (Norint) and three of Simula Innovation's commercialised and partly owned companies were runner-ups for the Innovation Award presented by DnB Nor.

Dr. Audun Fosselie Hansen,
Director of Simula Innovation

> Started in April 2006, Kalkulo is a subsidiary of Simula that is run on fully commercial terms. Kalkulo provides the Simula organization with a unit dedicated to delivering software development services supporting the research activity of Simula. Our current core competence is in the field of technical software, with special emphasis on scientific visualisation and 3D geometric modeling.

A year that called for growth

The year 2008 started out with many challenges. These were related to the fact that as of January 2008 Kalkulo was down from eight to four employees. This was due to deciding that during 2007 one of our former projects, called World Beside, would be better off managed as a separate company. In the process, four employees were transferred from Kalkulo to World Beside. At the same time, Simula Innovation became a major shareholder in World Beside. As a consequence, Kalkulo was in need of replacement personnel since the beginning of the year. Searching for skilled personnel was a high priority in 2008. It is satisfactorily noted that we succeeded in hiring very competent personnel in this process. In order to be able to deliver on all our projects, it was necessary to expand the staff, such that we were nine full-time employees by the end of the year

In addition to the need for new personnel, it was also considered important in 2008 to search for more project income in order to reduce the company's vulnerability. We set out with the ambition that this should be achieved by both expanding our current projects as well as aquiring new customers. We are happy to report that both these ambitions were met.

Dr. Christian Tarrou, Director of Kalkulo

The total revenue in 2008 was approximately 7 MNOK, which is not far from the total revenue in 2007 of 8.3 MNOK. Given that we were only four persons at the beginning of the year, this is a satisfactory result. Net profit in 2008 was about 0.9 MNOK.

Selected projects

StatoilHydro was by far Kalkulo's largest customer in 2008. Kalkulo has played an important role in Simula's research and development collaboration with StatoilHydro since the beginning. Kalkulo handles the development part of this collaboration, which consists of several projects. In the flagship project, Kalkulo developed a software application (property of StatoilHydro) called the 4D Litosphere Model (4DLM). This software can be briefly described as a kind of Google Earth for geoscientists. The budget for 4DLM rose considerably from 2007 to 2008. With this increased economic scope, considerable effort was spent on transforming 4DLM from a prototype into a powerful, robust, and user-friendly software tool. The 4DLM is scheduled for an early 2009 rollout to a limited group of users consisting of both StatoilHydro personnel and selected research partners.

Kalkulo provides the Simula organization with a unit dedicated to delivering software development services supporting the research activity of Simula

Finally, we are very happy to mention that Kalkulo has initiated collaboration with Statkraft Energi AS. Initial contact was made in the first half of 2008 and a pilot project was defined during the fall. This project is currently developing a software application for the quality control of measured meteorological data. The pilot project's ambition is that this application improves the way such quality control is carried out today. According to Statkraft, there is potential for improvement with respect to both robustness and efficiency. The idea is to use Kalkulo's experience with scientific visualisation to present the data in a way that makes erroneous values clearly stand out from the correct ones. Displaying the data using color-coded values is a key factor in this process.

KALKULO AS

KALKULO

n. from Norwegian *kalkulus*.
Borrowed from Late Latin *calculātus*, past participle of
calculāre, from Latin *calculus*; pebble, small stone used
in counting.

**Dr. Kristin Vinje,
Director of
Research Education**

"Simula School of Research and Innovation is the organisational unit with responsibility for all levels of education at Simula Research Laboratory. In particular, these levels count master students, research trainees, PhD students and postdoctoral fellows. The research trainee level refers to a one-year position that is used to assess and prepare candidates for a PhD project. All PhD students and postdoctoral fellows at Simula are associated with projects in the relevant basic research departments and are working closely with the other project members.

SIMULA SCHOOL OF RESEARCH AND INNOVATION AS

Simula School of Research and Innovation at the University of Oslo (The Simula School) was founded on 8 May 2007. In its first year of operation the Simula School has gained a firm foothold in the Simula Research Laboratory and has established a solid platform from which to develop further.

About the School

The aim of the Simula School is to educate highly qualified researchers within the field of ICT, as an attractive resource both for academia and for business and industry. The doctorates themselves are awarded by a partner university, in most cases the University of Oslo. The regulations of the partner universities regarding PhD programmes apply in full.

Instruction is given within Simula's three specialist research areas Networks and Distributed Systems, Scientific Computing and Software Engineering. The Simula School will strive to achieve a high PhD completion rate and a standard time-frame for PhD programmes. Management development programmes and career guidance at postdoctoral level are other key elements of the Simula School's activities.

Through the Simula School the students establish close connections with industry as a result of exchange programmes and international collaboration. Through specific initiatives and activities the School will ensure the necessary academic and social conditions to allow the students to focus on their work and conduct their research effectively

Important issues in 2008

Four of Simula's employees defended their doctorates in 2008, and 11 are expected to defend their theses in 2009. Of the School's 46 employees 29 are PhD students.

Throughout 2008, the Simula School has focused on two specific initiatives designed to enhance the competence of the students and postdoctoral fellows in research dissemination and in innovation and commercialisation. A course entitled Communicating Research in Science was developed in cooperation with the Penn State University, and was offered for the first time in the spring term. The response to the course was extremely positive and the School aims to build on this initiative by inviting students at research institutions from across the country to take part. The Innovation and Entrepreneurship course was developed in cooperation with Simula Innovation, and the first student intake is planned for January 2009.

The aim of the Simula School is to educate highly qualified researchers within the field of ICT

The Simula School aims to cooperate with relevant players in the public and private sectors, and with higher educational and research institutions both in Norway and abroad. The Simula School is engaged in a range of activities to introduce the school to potential players in industry who could become partners in the future. This year the School entered into a dialogue with Det Norske Veritas about possible future cooperation. A dialogue has also been initiated on the establishment of cooperation agreements with international, academic institutions such as Texas A&M. The Simula School was represented

at several career days at the University of Oslo and at the Norwegian University of Science and Technology (NTNU) and also took part in National Science Week, organised by the Research Council of Norway.

The Simula School was also involved in the "Science and Management" project at Valler Upper Secondary School. In addition to offering help with homework, the Simula School presented its academic activities to both teachers and pupils of Valler. This initiative will provide a basis for the development of further cooperation between upper secondary schools and Simula.

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OWNERSHIP STRUCTURE
As of 31 December 2008 the Simula School had the following shareholders:

Simula Research Laboratory AS	(56 %)
Norsk Hydro Produksjon AS	(21 %)
Bærum Municipality	(14 %)
Telenor Communication II	(7 %)
SINTEF Holding AS	(1 %)
The Norwegian Computing Center	(1 %).

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A key element at the school is the interaction between the student (the research trainee, PhD or postdoctoral fellow), the supervisors and the Simula School. The Simula School has drawn up a document entitled *Research Education at Simula – The Official Guide for Students, Postdocs and Supervisors*, which describes the various roles at the school and the expectations associated with them. The guide is available on: www.simula.no/education.

Seminars have been organised for PhD students and postdoctoral fellows respectively. These have had significance both academically and in terms of culture-building. The PhD seminar focused on providing a deeper examination of the topics set out in the above mentioned guide, while the seminar for postdoctoral fellows focused on the role of the researcher and on knowledge and experience sharing across research departments. Similar seminars are planned to be held on an annual basis.

Personnel and working environment
The working environment at the Simula School is generally good. The School aims to provide its employees with the best possible working environment to allow them to focus completely on demanding research assignments. Of the 46 employees, 9 are women and 21 come from countries other than Norway. In 2008 committees were established to ensure that gender equality and integration issues are addressed at Simula. In 2008 greater emphasis was given to branding and profiling, as part of the effort to ensure future recruitment. The Simula School has participated in a number of career days at various Scandinavian universities.

Looking ahead
The aim of the Simula School is to increase its number of doctoral candidates and at the same time enhance the quality of the education. The need for graduates with a high level of ICT expertise is great. This expertise is sought after by both business and industry and the authorities. Assuming that the Simula School manages to secure funding, it will be able to produce 15 highly qualified and academically sought-after graduates each year.

RESEARCH EDUCATION

DOCTORATES*	THESES	SUPERVISORS
Amundsen, Sten Lundesgaard	QoS-awareness at the middleware level for mobile computing systems	Frank Eliassen Gordon Blair
Sem-Jacobsen, Frank-Olaf	Towards a unified interconnect architecture: combining dynamic fault tolerance with quality of service, community separation, and power saving	Tor Skeie
Dzidek, James	Empirical evaluation of the costs and benefits of UML in software maintenance	Erik Arisholm Lionel Briand
Nordbotten, Nils Agne	Fault-tolerant routing in interconnection networks	Tor Skeie Olav Lysne

MASTERS*	THESES	SUPERVISORS
Brunsvig, Espen Langfeldt	How much empirical evidence is there to support claims made by software engineering tool providers about the benefits of their tools, and how valid is this evidence?	Magne Jørgensen
Bystrøm, Roger	Component Framework for Wireless Sensor Networks	Frank Eliassen
Eide, Ingrid	Modeling Atrial Heterogeneity	Mary C. MacLachlan Joakim Sundnes
Endestad, Tore Langedal	Peer Selection in Peer-to-Peer Streaming Systems	Haakon Riiser Pål Halvorsen Carsten Griwodz
Espeland, Håvard	Investigation of parallel programming on heterogeneous multiprocessors	Carsten Griwodz Pål Halvorsen
Evensen, Kristian Riktor	Improving TCP for time-dependent applications	Pål Halvorsen Carsten Griwodz Andreas Petlund
Fiskvik, Joakim	Service Discovery in QoS-aware Component Architecture	Frank Eliassen
Fredrikson, Tonje Jystad	Scheduling of Data Streams over a Multicast Protocol	Pål Halvorsen Carsten Griwodz Håvard Espeland
Hentschel, Susanne	Modeling and Simulation of Blood Pressure in Rats	Kent-Andre Mardal Hans Petter Langtangen
Hoel, Mads Fredrik Skoge	Extending Diffpack with PETSc solvers and Preconditioners	Xing Cai
Huse, Tarjei	Is using images to test web pages the solution to a Sisyphean task?	Anne Schistad Solberg Bente Anda

MASTERS*	THESES	SUPERVISORS
Jia, Zhiguang	Some stability issues of the stationary Bidomain Modell	Bjørn Fredrik Nielsen Tomas Syrstad Ruud
Johannessen, Eivind Berg	Data mining techniques, candidate measures and evaluation methods for building practically useful fault-proneness prediction models	Erik Arisholm
Kalland, Kim Motoyoshi	A Navier-Stokes Solver for Single- and Two-Phase Flow	Hans Petter Langtangen Kristian Valen-Sendstad
Libak, Jakob Aleksander	Routing and Job Allocation in High Performance Clusters	Tor Skeie Åshild Solheim Thomas Sødring
Lorentzen, Bent Jarle	TCP's Influence on Interactive Multimedia Traffic	Pål Halvorsen
Lømo, Bjørn Erik	File System Supporting Arbitrarily Sized Allocation	Zeljko Vrba Carsten Griwodz
Nordang, Øyvind	Evaluation of resource distribution and discovery in the QuA middleware with focus on the peer-to-peer broker	Frank Eliassen
Pearce, Arlene Marie	Service Orchestration in IMS Centred Architecture	Terje Jensen Carsten Griwodz
Pedersen, Morten	Gigabit Linespeed packet analyzer on an IXP2400 network processor	Carsten Griwodz Pål Halvorsen
Risvik, Henning	Visualizing Multi-Way Sensory Data	Hans Petter Langtangen Oliver Tomic Tormod Næs
Salicath, Arne Alexander	Administrasjon og vurdering av programmerings-besvarelser	Gunnar Bergersen Erik Arisholm
Schröter, Melanie	Identification of Cardiac Infarctions from ECG-Measurements	Bjørn Fredrik Nielsen Martin Burger
Skoge Hoel, Mads Fredrik	Extending Diffpak with PETSc Solvers and Preconditioners	Xing Cai
Tennøe, Sverre Krohn	Synchronization in High-Performance Large-Scale Distributed Systems	Pål Halvorsen Torgeir Hovden
Ulvestad, Håkon Staalesen	Migrating Video Streaming Sessions in Planning-Based Middleware	Frank Eliassen Viktor Eide
Vikstrøm, Gustav Magnus	Parallelization strategies for DOLFIN	Anders Logg
Aardal, Øyvind	Post processing of raw data recorded with an ECG-vest	Marius Lysaker Andreas Austeng Bjørn Fredrik Nielsen

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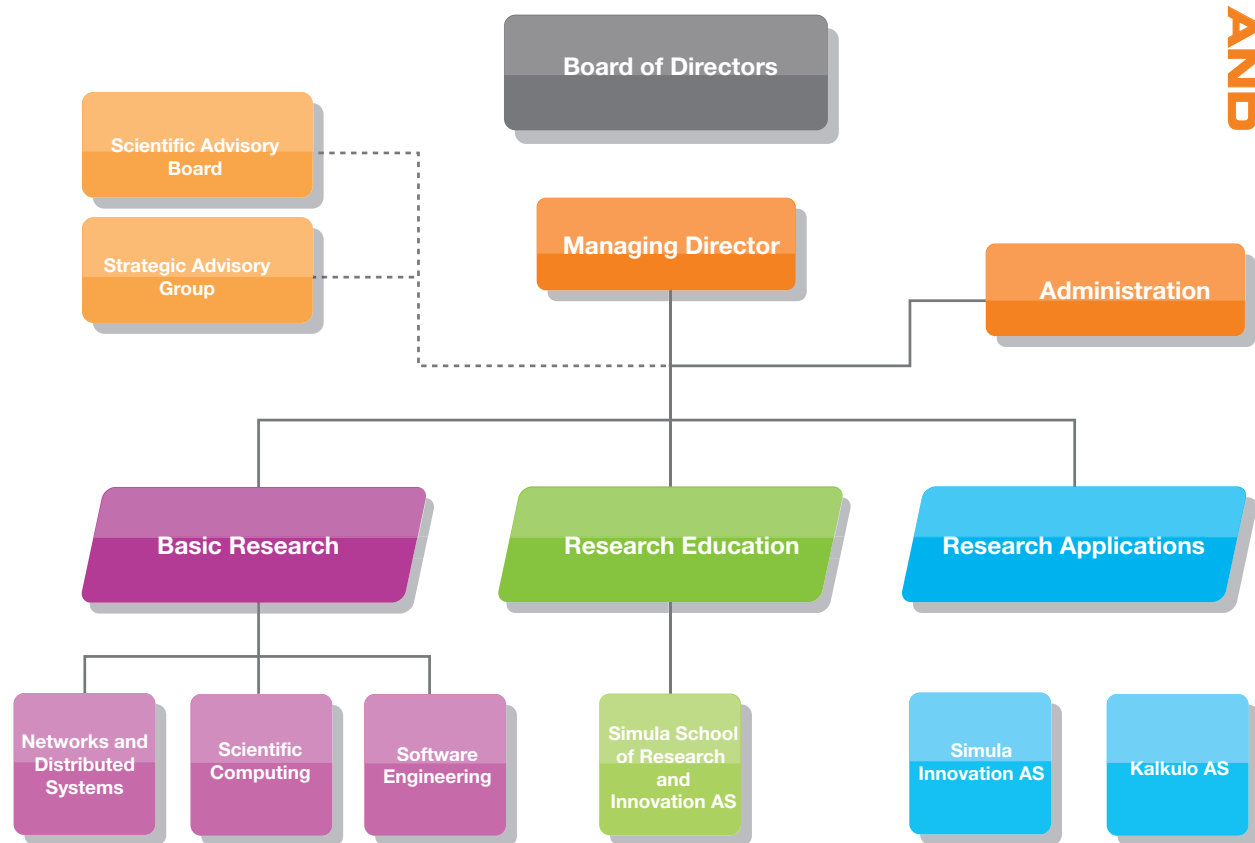
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[118] S. R. Clark. Time-Dependant Evolution of Subduction Zones. Invited Talk, 2008.

[119] S. R. Clark. Simulating and Visualising the Earth As a Dynamic System. Talk given to Valler High School Teachers, 2008.

[120] S. K. Dahl, L. R. Hellevik, and B. Skallerud. A 2D Patient-Specific FSI Assessment of Mitral Valve Dynamics During Diastolic Filling. Presented at 8th.World Congress on Computational Mechanics (WCCM8)/5th European Congress on Computational Methods in Applied Sciences and Engineeering (ECCOMAS 2008), Venice, Italy, 2008.

[121] O. M. Lysaker, B. F. Nielsen, P. Grøttum, A. Abildgaard, J. Fjeld, and K. Haugaa. Computer Simulations for Identifying Ischemic Heart Disease; a Validation Study. Presented at the BBG-MedViz seminar at the Department of Mathematics, University of Bergen, 2008.

[122] K.-A. Mardal, K. Valen-Sendstad, O. C. Myklebust, and S. Hentschel. Blood Flow Computations at Simula. Invited talk at Medical Physics, University of Wisconsin, March 11., 2008.

[123] A. Logg. A Symbolic Engine for Finite Element Exterior Calculus. Talk at the European Finite Element Fair 2008, Chalmers, Göteborg, 30th of May, 2008.

[124] A. Logg. A Symbolic Engine for Finite Element Exterior Calculus. Talk at the Workshop on Automating the Development of Scientific Computing Software (FEniCS'08), Lousiana State University, Baton Rogue, USA, 5th of March, 2008.

[125] A. Logg. FSI Development at CBC. Invited speaker at the Workshop on FSI for Biomedical Applications, Trondheim, 8th of September, 2008.

[126] B. F. Nielsen, M. Lysaker, P. Grøttum, A. Tveito, A. Abildgaard, J. G. Fjeld, and K. H. Haugaa. The Inverse Problem of Identifying Ischemic Heart Disease. Presented at the annual meeting of European Cardiac Simulation Group, Bologna, Italy, 2008.

[127] S. R. Clark. Geodynamics: the Physics and Mathematics of Terrestrial and Extra-Terrestrial Processes. Talk at the Center for Biomedical Computing Annual Meeting, 2008.

[128] S. Linge, A. E. Løvgren, K.-A. Mardal, V. Haughton, and H. P. Langtangen. Chiari Malformation - the Problem and a Mathematical Approach. Invited talk, Vinderen Medical Center, 8th of December, Oslo, Norway, 2008.

[129] S. Linge, A. E. Løvgren, K.-A. Mardal, V. Haughton, and H. P. Langtangen. Cerebrospinal Fluid Flow Simulations - Normal Subjects and Patients With Chiari I Malformation. Talk, seminar at CBC, Simula Research Laboratory, 31st of October, Oslo, Norway, 2008.

[130] A. Schroll. On Computational Mathematical Modeling. Colloquium, The University of Southern Danmark, 2008.

[131] A. Logg. FEniCS Tutorial. Talk at CBC Seminar, Oslo, 6th of November, 2008.

[132] H. Narayanan. Toward a Goal-Oriented Error-Controlled Solver for the Incompressible Navier-Stokes Equations. Talk at the 2008 Robust Flow Solver Workshop at Simula Research Laboratory, Oslo, Norway, 2008.

[133] K. ten Tusscher. The Role of Genome and Regulatory Network Architecture Canalization in the Evolution of Multi-Trait Polymorphism and Sympatric Speciation. presentation at the Centre for Ecological and Evolutionary Synthesis at the University of Oslo, Department of Biology, 2008.

[134] K. ten Tusscher. Genome and Gene Regulatory Network Canalization in the Evolution of Polymorhism and Sympatric Speciation. Presentation at Symposium "Celebrating 30 years of Bioinformatics" at Utrecht University, 2008.

[135] J. Sundnes. Computational Challenges in Mathematical Models of the Heart. Talk at Norwegian University of Life Sciences, January 30th, 2008, 2008.

[136] S. R. Clark, A. M. Bruaset, and T. M. Løseth. Handling Uncertainty in Numerical Models of Sedimentary Deposition: a Stochastic Approach. 33rd International Geological Congress, Oslo, 2008.

[137] O. Al-Khayat, T. Løseth, A. M. Bruaset, and H. P. Langtangen. Particle-Based Methods in the Modelling of Turbidity Currents and Turbidites. Talk at the 33rd International Geological Congress in Oslo, 2008.

[138] K. Valen-Sendstad, A. Logg, and K.-A. Mardal. Developing Flow Solver Methodology for Patient Specific Simulation of Hemodynamics. Talk at Workshop on Finite Element Methods for Fluids and Fluid-Structure Interaction, June 5, 2008.

[139] A. Logg. Just-in-Time Compilation of Finite Element Variational Forms. Talk at the Finite Element Circus and Rodeo, Louisiana State University, Baton Rogue, USA, 7th of March, 2008.

[140] M. S. Alnæs and K.-A. Mardal. SFC - the SyFi Form Compiler. Talk at the FEniCS'08 Workshop, March 5-7, Baton Rouge, Louisiana, 2008.

[141] J. E. Hake and G. T. Lines. Modelling the Mesoscopic Length Scale of EC Coupling: the Diadic Cleft. Invited talk at "European Conference on Mathematical and Theoretical Biology", 2008.

[142] B. F. Nielsen, O. M. Lysaker, P. Grøttum, A. Tveito, A. Abildgaard, J. G. Fjeld, and K. H. Haugaa. On the Use of Computer Simulations for Identifying Ischemic Heart Disease; Theoretical and Practical Aspects. Presented at the workshop "Mathematics in Medicine/Biology", Centre of Mathematics for Applications, Department of Mathematics, University of Oslo, 2008.

[143] X. Cai. Simulation of Tsunami Propagation. Talk at the 2nd eScience Meeting, Jan. 21–22, Geilo, Norway, 2008.

[144] X. Cai. High-Performance Computing on Distributed-Memory Architecture. Lecture at the 2008 Winter School on Parallel Computing, Jan. 20–25, Geilo, Norway, 2008.

[145] O. M. Lysaker, B. F. Nielsen, P. Grøttum, A. Abildgaard, J. Fjeld, and K. Haugaa. Theoretical and Practical Aspects of the Inverse Problem of Electrocardiography. Presented at the Fourth International Conference "Inverse Problems: Modeling and Simulation", Turkey, 2008.

[146] B. F. Nielsen, O. M. Lysaker, P. Grøttum, A. Tveito, A. Abildgaard, J. G. Fjeld, and K. H. Haugaa. Theoretical and Practical Aspects of the Inverse Problem of Electrocardiography. Presented at Institut für Mathematik und Wissenschaftliches Rechnen, Karl Franzes Universität in Graz, Austria. Also presented at Institut für Numerische und Angewandte Mathematik, Westfälische Wilhelms-Universität Münster, Germany, 2008.

[147] X. Cai. Parallel Computing; Why & How? Lecture at the 2008 Winter School on Parallel Computing, Jan. 20–25, Geilo, Norway, 2008.

[148] A. Logg. The FEniCS Project. Inviteted speaker at the Workshop on Data Structures for Finite Element and Finite Volume Computations, Freie Universität Berlin, 29th of February, 2008.

[149] X. Cai. Use of Advanced Computing in Tomographic Surveys. Talk at PARA 2008, May 13–16, Trondheim, Norway, 2008.

[150] X. Cai. Resource-Efficient Simulation of Tsunami Wave Propagation on Parallel Computers. Invited talk at 2nd Internationsal Symposium for Integrated Predictive Simulation System for Earthequake and Tsunami Disaster, October 21–22, Tokyo, Japan, 2008.

[151] K.-A. Mardal, K. Valen-Sendstad, O. C. Myklebust, and S. Hentschel. Scientific Computing at Simula. Invited Talk at Workshop on Cerebral Aneurysms and Subarachnoidal Hemorrhage, Tromsø Jan 24–26, 2008.

[152] K.-A. Mardal. Hemodynamics in the Circle of Willis. Invited talk at Institute for Computational and Applied Mathematics, Muenster, Germany, November 18, 2008.

[153] K. ten Tusscher. Evolutionary Biology for Non-Biologists. talk at the yearly CBC seminar, 2008.

[154] O. Al-Khayat, H. P. Langtangen, and A. M. Bruaset. A Coupled Lattice Boltzmann Model for a Turbulent Sand-Laden Fluid Flow. Talk at the DSFD conference in Brazil, 2008.

[155] H. P. Langtangen, O. Al-Khayat, and A. M. Bruaset. Numerical Python. Four day course at the University of Erlangen, 2008.

[156] O. Al-Khayat, A. M. Bruaset, and H. P. Langtangen. Numerical Modeling of Turbidity Flow With the Lattice Boltzmann Method. Talk at the Computational Geoscience workshop, Simula Research Laboratory, 2008.

[157] K.-A. Mardal, B. F. Nielsen, and M. S. Alnæs. Two Steps Towards Automating Efficient Solution of Inverse Problems. Invited Talk at the FEniCS'08 Workshop, March 5–7, Baton Rouge, Louisiana, 2008.

[158] S. Linge, A. E. Løvgren, K.-A. Mardal, V. Haughton, and H. P. Langtangen. Cerebrospinal Fluid Flow in Normal and Chiari Subjects. Talk, seminar at CBC (Simula Research Laboratory), 16th of December, Oslo, Norway, 2008.

[159] S. Linge, A. E. Løvgren, K.-A. Mardal, and H. P. Langtangen. Simulating the Cerebral Fluid Flow Associated With Chiari I Malformation in Idealized Geometries. Talk, seminar at CBC (Simula Research Laboratory), 25th of June, Oslo, Norway, 2008.

[160] J. B. Haga. Parallel Computations and the Finite Element Method. Invited talk at Sintef Applied Mathematics group, 2008.

[161] S. R. Clark, M. Gurnis, and D. M. Slabs in the Mantle - Dynamic Topography and Mantle Rheology in the South-Western Pacific. 33rd International Geological Congress, Oslo, 2008.

[162] D. Kaspar and A. F. Hansen. A Survey of Network Striping. Technical Report, 2008.

[163] S. Grimstad and F. Torvund. Prediction Markets - a Different Approach to Software Cost Estimation. JavaZone webpages, 2008.

[164] S. Grimstad. Two Important Agile Project Management Technologies: Scrum and Planning Poker. Seminar, Kathmandu University, 2008.

[165] S. Grimstad. Estimering Av Systemutviklingsarbeid. Tekna, faggruppemøte, 2008.

[166] D. Pfahl. Simulation-Based Planning, Re-Planning and Stability Analysis for Operational Release Plans. Invited lecture at Institute of Software Chinese Academy of Science (ISCAS), Beijing, 23 October, 2008.

[167] D. Pfahl. Meeting the Quality Goals – Better Software Products Through Accelerated Technology Evaluation in a Virtual Software Production Laboratory (VSPL). Invited lecture at Laboratory for Internet Software Technologies (iTechs), Institute of Software Chinese Academy of Science (ISCAS), Beijing, 20 October, 2008.

[168] M. Jørgensen. Hvorfor Læring Av Erfaring Er Vanskelig Og Hvordan Bli Bedre. Presentation at JavaZone, 2008.

[169] M. Jørgensen. Avoiding Impact From Irrelevant and Misleading Information. Presentation at Chalmers University, Gøteborg, 2008.

[170] M. Jørgensen. Kulturforskjeller Og Outsourcing Av IT-Prosjekter Inni Er Vi Like - Eller Er Vi Egentlig Det? Presentation at Simula's Industry Seminar, 2008.

[171] M. Jørgensen. Software Project Planning and Management: Why It Fails and How to Improve It. Presentation at Kathmandu University, 2008.

[172] M. Jørgensen. Hjelper Smidige Metoder? Article in Computerworld Norge, 2008.

[173] M. Jørgensen. Kulturforskjeller Og Offshoring-Prosjekter. Article in Computerworld Norge, 2008.

[174] M. Jørgensen and S. Grimstad. Human Biases in Forecasting of Work-Effort: Differences in Effect Sizes in Laboratory and Field Settings. Presentation at International Symposium on Forecasting, 2008.

[175] M. Jørgensen. Rasjonalitetens Makt Og Maktens Rasjonalitet. Presentation at Objectnet seminar (Dublin), 2008.

[176] M. Jørgensen. When Should We Trust Expert Judgment in Software Development? Presentation at Technische Universität München, 2008.

[177] M. Jørgensen. Best for Hvem. Article in Computerworld Norge, 2008.

[178] M. Jørgensen. Priming. Article in Computerworld Norge, 2008.

[179] S. Grimstad and M. Jørgensen. Sequence Effects in Judgment-Based Software Development Work-Effort Forecasting. Proceedings of the 28th International Symposium on Forecasting, 2008.

[180] S. Grimstad. Estimering I Smidige Prosjekter. Seminar, Ergo Group (Oslo), 2008.

[181] S. Grimstad. Prediksjonsmarkeder: Oppdaterte Erfaringer. BEST-seminar, 2008.

[182] M. Jørgensen. Software Development Effort Estimation: Why It Fails and How to Improve It. Presenation at TMA Solution (Vietnam) seminar, 2008.

[183] M. Jørgensen. Software Development Effort Estimation: Why It Fails and How to Improve It. Presentation at Silverstone (India) Seminar, 2008.

[184] M. Jørgensen. Software Development Effort Estimation: Why It Fails and How to Improve It. Presentation at D2Hawkeye (Nepal) seminar, 2008.

[185] M. Jørgensen. Læring Av Erfaring. Presentation at Nordnet (project management conference), 2008.

[186] M. Jørgensen. Økt Psykologisk Distanse Fører Til økt Optimisme. Article in Computerworld Norge, 2008.

[187] M. Jørgensen. Peer, Du Lyver! Nei, Jeg Gjør Ei! Article in Computerworld Norge, 2008.

[188] M. Jørgensen. How to Avoid Impact From Irrelevant and Misleading Information on Your Cost Estimates. Presentation at Itestra Seminar (München), 2008.

[189] M. Jørgensen. The Impact of Irrelevant and Misleading Information on Software Development Effort Estimation: a Randomized, Controlled Field Experiment of Forty-Six Outsourcing Companies. Presentation at IT University Copenhagen, 2008.

[190] M. Jørgensen. Prinsipper for Estimering Av Utviklingskostnader I IT-Prosjekter. Keynote at Geiloseminaret, 2008.

[191] M. Jørgensen. Kritisk Tenkning. Article in Computerworld Norge, 2008.

" The highest body at Simula Research Laboratory is the board of directors, which is appointed by the owners of Simula at the General Assembly. Adhering to the provisions of the Companies Act, this board makes strategic decisions and approves the budget and annual reports. It appoints the managing director, who in turn organises the company's activities. The company is divided into three units corresponding to Simula's three main tasks: Basic Research organises research activities, Research Education is administratively responsible for the PhD students and postdoctoral fellows, and Research Applications is responsible for promoting the application of the research results.

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Research Education streamlines the formation of PhD students and postdoctoral fellows. It consists of the Simula School of Research and Innovation (SSRI) and with Simula as the majority stakeholder. A PhD student at Simula will be affiliated with SSRI and will report administratively to this unit. The student's day-to-day work, scientific research, and supervision, however, take place in the corresponding research department in Basic Research.

Research Applications consists of the two wholly owned subsidiaries Simula Innovation and Kalkulo.

There are two advisory bodies reporting directly to the managing director: the Scientific Advisory Board (SAB), and the Strategic Advisory Group.

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Haughton, Victor. Adjunct Research Scientist.
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Hentschel, Susanne. Research Trainee.
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Kaspar, Dominik. PhD Student.

Knudsen, Arve. Software Engineer.

Kvalbein, Amund. Postdoctoral Fellow.

Larson, Mats. Adjunct Research Scientist.

Li, Pan. Postdoctoral Fellow.

Lines, Glenn Terje. Research Scientist.

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Logg, Anders. Research Scientist.

Lysaker, Ola Marius. Postdoctoral Fellow.

Løvgren, Alf Emil. Postdoctoral Fellow.

MacLachlan, Mary. Postdoctoral Fellow (on maternity leave).

Maleckar, Molly. Postdoctoral Fellow.

Mardal, Kent-Andre. Research Scientist.

McCulloch, Andrew. Adjunct Research Scientist.

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Pedersen, Geir Kleivstul. Adjunct Research Scientist.

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Prot, Victorien. Postdoctoral Fellow.

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Rognes, Marie Elisabeth. PhD Student.

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Røtnes, Pål. System Administrator.

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Sjøberg, Dag. Research Scientist.

Skavhaug, Ola. Research Scientist.

Skeie, Tor. Adjunct Research Scientist.

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Unat, Didem. PhD Student.

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Wall, Samuel. Postdoctoral Fellow.

Wei, Wenjie. PhD Student.

Wilbers, Ilmar. Scientific Programmer.

Xiang, Jie. PhD Student.

Xin, Qin. Postdoctoral Fellow.

Zhang, Yan. Research Scientist.

Åmillom, Elisabeth. Executive Officer.

* as of 1 March 2009