

2018 Geilo Winter School | Practical Artificial Intelligence

January 21-26, 2018, Geilo, Norway

SCHEDULE

At a glance:

| | Sunday | Monday | Tuesday | Wednesday | Thursday | Friday | |
|---------------|--------|----------------------|--------------------------|----------------|--------------------------------|-------------------------------|-----------------------|
| 07:30 - 09:00 | X | Breakfast | | | | | |
| 09:00 - 09:45 | | Python 101 | AMIDST part 2 | Regression | Support vector machines | Convolutional Neural Networks | |
| 09:45 - 10:30 | | Break | | | | | Checkout by 11:00 |
| 10:30 - 11:00 | | | | | | | (Lunch 12:30 - 14:00) |
| 11:00 - 11:45 | | | | | | | X |
| 11:45 - 12:30 | | AI and Deep learning | Scientific Python for AI | Decision trees | Artificial neural networks | | |
| 12:30 - 15:00 | | | | | | | |
| 15:00 - 15:45 | | Coffee | | Poster part 1 | Coffee | | |
| 15:45 - 16:30 | | Introduction | AMIDST part 1 | AMIDST part 3 | Containers and using the cloud | Comparing AI techniques | |
| 16:30 - 17:00 | | | | | | | |
| 17:00 - 17:45 | | | | | | | |
| 17:45 - 18:30 | | | | | | | |
| 18:30 - 19:15 | | | | | | | |
| 19:30 | Dinner | | | | | | |

Detailed program:

Sunday:

16:30 – 17:00: Coffee
 17:00 – 17:45: **Brodtkorb:** Welcome & Intro
 17:45 – 19:15: **Rasheed:** Introduction to AI and ML
 19:30: Dinner

Monday:

09:00 – 10:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 1
 10:30 – 15:00: Break
 15:00 – 16:30: **Lingjærde:** From neural networks to deep learning
 16:30 – 17:00: Coffee
 17:00 – 18:30: **Arredondo:** Amidst tutorial part 1
 19:30: Dinner

Tuesday:

09:00 – 10:30: **Arredondo:** Amidst tutorial part 2
 10:30 – 15:00: Break
 15:00 – 16:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 2
 16:30 – 17:00: *Poster session part 1*
 17:00 – 18:30: **Arredondo:** Amidst tutorial part 3
 19:30: Dinner

Wednesday:

09:00 – 10:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 3
 10:30 – 15:00: Break
 15:00 – 16:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 4
 16:30 – 17:00: Coffee
 17:00 – 18:30: **Kahn:** Containers and cloud for AI
 18:30 – 19:15: *Poster session part 2*
 19:30: Dinner

Thursday:

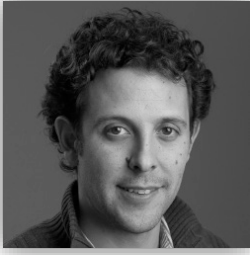
09:00 – 10:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 5
 10:30 – 15:00: Break
 15:00 – 16:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 6
 16:30 – 17:00: Coffee
 17:00 – 18:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 7
 19:30: Dinner

Friday:

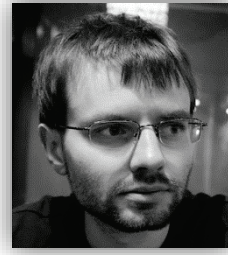
09:00 – 10:30: **Rasheed, Fonn, Johannessen, Tabib:**
 Tutorial part 8
 10:30 – 11:45: Break (Remember check out by 11:00)
 11:45 – 14:30: Summary and lunch
 15:19 Train to Oslo
 15:41 Train to Bergen

The Geilo winter school is funded by the Research Council of Norway. It is organized by **André R. Brodtkorb** and the scientific committee consisting of **Inga Berre** (University of Bergen), **Xing Cai** (Simula, University of Oslo), **Anne C. Elster** (Norwegian University of Science and Technology), **Margot Gerritsen** (Stanford), **Helwig Hauser** (University of Bergen), **Trond Kvamsdal** (Norwegian University of Science and Technology), **Knut-Andreas Lie** (SINTEF, Norwegian University of Science and Technology), **Hans Ekkehard Plesser** (Norwegian University of Life Sciences), **Geir Storvik** (University of Oslo), and **Ståle Walderhaug** (SINTEF, Arctic University of Norway).

LECTURERS



Andres Masegosa Arredondo



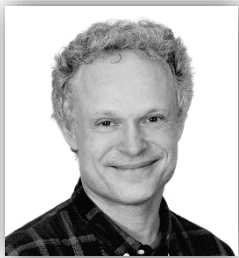
Eivind Fonn



Kjetil André Johannessen



Malik Khan



Ole Christian Lingjærde



Adil Rasheed



Mandar Tabib

Andres Masegosa Arredondo,
Universidad de Almería

Email: andresma@ual.es

Dr. Andres Masegosa has a Ph.D. in computer science from Universidad de Granada, Spain, and has been working on the AMISDT EU funded project (<http://project.amidsttoolbox.com>) for analyzing massive data streams with probabilistic graphical models. He is currently working as Principal Investigator in the project "INFER.java: A probabilistic programming language for developing machine learning applications on big data" at the Universidad de Almería.

Topics: Tutorial on the AMIDST toolbox

<http://www.amidsttoolbox.com/>

Anne Cahtrine Elster, Norwegian
University of Science and Technology

Email: anne.elster@gmail.com

Professor Anne C. Elster is the founder and leader of the NTNU HPC-lab with a focus on GPU and high performance computing. She is currently involved in the CLOUDLIGHTNING project funded by the European Union, where she has been involved in the use of artificial intelligence and heterogeneous resources for high performance computing.

Topics: Using artificial intelligence to develop HPC

Eivind Fonn, SINTEF Digital

Email: eivind.fonn@sintef.no

Dr. Eivind Fonn has a PhD from ETH Zurich and is a research scientist at SINTEF Digital. He works with applied mathematics, reduced order modeling, machine learning and artificial intelligence.

Topics: Machine learning and practical artificial intelligence

Kjetil André Johannessen, SINTEF
Digital

Email: Kjetil.Johannessen@sintef.no

Dr. Kjetil Andre Johannessen has a PhD from NTNU and is a researcher at SINTEF Digital and a postdoc at NTNU. He has been working with isogeometry, spline technologies, artificial intelligence, and machine learning.

Topics: Tutorial on machine learning and practical artificial intelligence

Malik Khan, Norwegian University of
Science and Technology

Email: zakimurtaza@gmail.com

Dr. Malik M. Khan is a research scientist at NTNU, where he works on the EU project Cloudlightning financed by the Horizon 2020 programme. His work focuses on the efficient use of heterogeneous HPC resources in a cloud setting.

Topics: Using AI in complex software stacks.

Ole Christina Lingjærde, University of
Oslo

Email: ole@ifi.uio.no

Professor Ole Christian Lingjærde is affiliated with the research group focusing on Biomedical Informatics (BMI) at the Department of Informatics at the University of Oslo. He is also head of the Biostatistics and Bioinformatics group at the KG Jebsen Centre for Breast Cancer Research.

Topics: From neural networks to deep learning

Adil Rasheed, SINTEF Digital

Email: adil.rasheed@sintef.no

Dr. Adil Rasheed is a senior scientist at SINTEF Digital and an associate professor at NTNU. He is the research manager for the Computational Science and Engineering group, and has a key role in the Big-Learning initiative within SINTEF.

Topics: Tutorial on machine learning and practical artificial intelligence.

Mandar Tabib, SINTEF Digital

Email: mandar.tabib@sintef.no

Dr. Mandar Tabib is a research scientist at SINTEF Digital where he works with fluid dynamics, machine learning and artificial intelligence within wind energy, transport safety, biomedicine, chemical engineering, reactive multi-phase flow, and aviation runway safety.

Topics: Tutorial on machine learning and practical artificial intelligence

PARTICIPANTS

| Name: | Field of research: | Affiliation / Home institution: | Email: |
|--------------------------------------|-------------------------------|--|-------------------------------------|
| Asieh Abolpour Mofrad | Informatics | HiOA/ PhD stipendiat Western Norway University of Applied Sciences | asieh.abolpour-mofrad@hioa.no |
| Samaneh Abolpour Mofrad | Mathematics | | sam@hvl.no |
| Anders Albert | Mathematics | Sintef | anders0albert@gmail.com |
| <i>Vaneeda Allken</i> | Physics | Havforskningsinstituttet | vaneeda.allken@hi.no |
| Erling Andersen | Physics | Haukeland University Hospital | Erling.Andersen@Helse- Bergen.NO |
| Andres Masegosa Arredondo | Machine learning | Universidad de Almería | andresma@ual.es |
| Anis A. Ayati | Physics | University of Oslo | awalaa@math.uio.no |
| <i>Badreddine Benyacoub</i> | Statistics | Mohammed VI International Academy of Civil Aviation | b.benyacoub@onda.ma |
| Justyna Beresniewicz | Other | University of Bergen | justynaberes@gmail.com |
| <i>Runar Berge</i> | Mathematics | University of Bergen | runar.berge@uib.no |
| Arne Bockmann | Physics | DNV GL / UiO | arne.bockmann@dnvgl.com |
| Andreas Brandsæter | Statistics | DNV GL / UiO | andreas.brandsaeter@dnvgl.com |
| André Brodtkorb | Informatics | SINTEF | Andre.Brodtkorb@sintef.no |
| <i>Giorgia Carra</i> | High performance computing | K.U. Leuven | giorgia.carra@kuleuven.be |
| James Richard Catmore | Physics | University of Oslo | j.r.catmore@fys.uio.no |
| Minjoo Choi | Mathematics | Sintef digital | minjoo.choi@sintef.no |
| Sindre Eik De Lange | Informatics | Western Norway University of Applied Sciences | Sindreedelange@gmail.com |
| Peder Eliasson | Physics | SINTEF | peder.eliasson@sintef.no |
| Anne Cathrine Elster | High performance computing | NTNU | anne.elster@gmail.com |
| Sarah Fallmann | Informatics | De Montfort University | sarah.fallmann@dmu.ac.uk |
| Eivind Fonn | Mathematics | SINTEF Digital | eivind.fonn@sintef.no |
| Andrea Alessandro Gasparini | Informatics | University of Oslo / Library / Inst. of Inf. | a.a.gasparini@ub.uio.no |
| Maryam Ghaffari | Physics | University of Bergen | Maryam.Ghaffari@uib.no |
| Sebastian Gjertsen | Mathematics | Shortcut AS | sebastian.gjertsen@shortcut.no |
| Odin Gramstad | Mathematics | DNV GL | Odin.Gramstad@dnvgl.com |
| Eirik Gramstad | Physics | University of Oslo | eirik.gramstad@fys.uio.no |

| | | | |
|--|----------------------------|--|---|
| Renate Grüner | Physics | Haukeland univ. hospital | renate@fmri.no |
| Trond Hagen | Mathematics | SINTEF | trr@sintef.no |
| Andreas Hammerbeck | Informatics | Høgskolen på Vestlandet | Andreas_93@hotmail.com |
| <i>Nils Olav Handegard</i> | Mathematics | Havforskningsinstituttet | nilsolav@hi.no |
| Cecilia Holmgren | Mathematics | Uppsala University | ciaholmgren3@gmail.com |
| Ivar Thokle Hovden | Cybernetics | NTNU | ivarthov@stud.ntnu.no |
| Kjetil Andre Johannessen | Mathematics | SINTEF | Kjetil.Johannessen@sintef.no |
| Shaafi Mohamed Kaja Kamaludeen | Other | Delft university of technology | s.m.kajakamaludeen@tudelft.nl |
| Sathiesh Kaliyugarasan | Informatics | Western Norway University of Applied Sciences | skaliyugarasan@hotmail.com |
| <i>Diana Karoseviciute</i> | Statistics | Kaunas University of Technology | d.karoseviciute@gmail.com |
| Katarzyna Anna Kazimierczak | Neuroscience | University of Bergen | katarzyna.kazimierczak@uib.no |
| Malik M Khan | High performance computing | NTNU | zakimurtaza@gmail.com |
| <i>Øystein Strengehagen Klemetsdal</i> | Mathematics | NTNU | oystein.klemetsdal@ntnu.no |
| Knut Erik Knutsen | Marine | DNV GL AS | knut.erik.knutsen@dnvgl.com |
| Makan Konte | Informatics | ISIM BUSINESS SCHOOL | mkonte2@hotmail.fr |
| Michael Kraetzschmar | Mathematics | Flensburg University of Applied Sciences | kraetzschmar@mathematik.fh-flensburg.de |
| Swetlana Kraetzschmar | Mathematics | Flensburg University of Applied Sciences | swetlana.puschkarewskaja-kraetzschmar@fh-flensburg.de |
| Trond Kvamsdal | Mathematics | SINTEF Digital | Trond.Kvamsdal@sintef.no |
| <i>Johannes Langguth</i> | High performance computing | Simula | langguth@simula.no |
| Jürgen Lenz | Manufacturing | University of Stuttgart | jhlenz@gmail.com |
| Ole Christian Lingjærde | Statistics | University of Oslo | ole@ifi.uio.no |
| Veronica Liverud Krathe | Mechanical engineering | DNV GL | veronica.krathe@dnvgl.com |
| <i>Arvid Lundervold</i> | Informatics | University of Bergen | arvid.lundervold@gmail.com |
| Jonas Lundervold | Business | Handelshøyskolen BI Campus Bergen | jonas.lundervold@gmail.com |
| Ketil Malde | Informatics | Institute of Marine Research | ketil.malde@imr.no |
| Signe Moe | Mathematics | Sintef Digital/NTNU ITK | signe.moe@itk.ntnu.no |
| Ahmed Mohammed | Informatics | University of Oslo Library | a.a.mohammed@ub.uio.no |
| Daulet Moldabayev | Mathematics | Tryg Forsikring AS | daulet.msu@gmail.com |
| Felix Georg Mueller | Engineering | Fraunhofer IPA | felix.mueller@ipa.fraunhofer.de |
| <i>Georg Muntingh</i> | Mathematics | SINTEF Digital | georg.muntingh@sintef.no |
| Sean Meling Murray | Statistics | Universitetet i Bergen | sean.meling@gmail.com |
| Henrik Nyhus | Statistics | OneSubsea | hnyhus@slb.com |
| Bogdan Osyka | Energy | Rystad Energy | bogdan.osyka90@gmail.com |
| Daniele Panfilo | Library science | Università degli studi di Trieste | danielepanfilo@gmail.com |
| Ulin Nuha Abdul Qohar | Mathematics | Dept. of Mathematics University of Bergen | Ulin.Qohar@uib.no |
| <i>Andrea Raffo</i> | Mathematics | SINTEF Digital | andrea.raffo@sintef.no |
| Adil Rasheed | Mathematics | SINTEF Digital | adil.rasheed@sintef.no |
| Thomas Roebnitz | High performance computing | University of Oslo | thomas.roebnitz@usit.uio.no |
| Hallvard Røyrane-Løtvedt | Statistics | Tryg forsikring | lothal@tryg.no |
| Anne Marthine Rustad | Cybernetics | SINTEF Digital | annemarthine.rustad@sintef.no |
| Nejm Saadallah | Informatics | IRIS | nejm.saadallah@iris.no |
| <i>Abdelhadi Sabry</i> | Physics | International Academy Mohammed 6th of Civil Aviation | a.sabry@onda.ma |
| Geir Inge Sandnes | Statistics | Gjensidige | geir-inge.sandnes@gjensidige.no |

The Geilo Winter Schools in eScience

The very first winter school was organized in 2001 by Knut-Andreas Lie, then Research Director for SINTEF Applied Mathematics. He wanted to create a meeting place for Ph.D. students and young researchers to foster interaction and catch up on recent developments within eScience. This was at a time when a 1.6 MB file was considered “huge”, and the first school topic was “Cluster computing”.



Having organized the winter school for over 10 years, Knut-Andreas Lie gradually passed on the responsibility to André R. Brodtkorb who is the current organizer. The first seven schools were funded by the Research Council of Norway through the BeMatA program, and continued with nine years of funding by the eVITA program. The school is currently a project funded by the IKTPLUSS program for the period 2016-2020.

The school has provided hundreds of lectures on topics relevant to the Norwegian eScience community over the last 17 years, ranging from parallel computing and Big Data to Monte Carlo simulations and continuum mechanics. The schools have attracted around 1000 participants from industry, research and academic institutions in Norway, Scandinavia, and the rest of the world.

Dr. Holms hotel

Geilo is renowned as one of the best winter sports resorts in Northern Europe, located in the mountains between Oslo and Bergen. Geilo lies at an altitude of 800 meters with its highest alpine slope starting at 1178 meters above sea level. This ensures good snow conditions throughout the winter. Geilo offers 35 varied and well groomed downhill slopes and 18 lifts with a capacity of 25.000 trips pr. hour. Moreover, there are excellent possibilities for cross country skiing, with approximately 500 km of trails, both in the valley and in the mountains.



Dr. Holms Hotel is a distinguished hotel situated right next to the ski slopes. It was opened in 1909 by Dr. Ingebrikt Christian Holm, coinciding with the opening of the railway. The intended use was for asthmatic city dwellers from Oslo and Bergen to refresh with the clear and unpolluted mountain air (Dr. Holm was a specialist in respiratory diseases). It has been occupied during the second World War, expanded multiple times, and even sports its own hotel ghost, the gray lady. If you're lucky, you might meet her in the staircase in the gray hours of the morning.

The Geilo Winter Schools in eScience are organized by SINTEF Digital,
and funded by the Research Council of Norway under project number 249772/O70