



Schedule for NGE0316, “AI for Earth and Environmental Sciences”

Date: Version Feb 1, 2022

| Date | Time | Activity ¹ | Topic | Lecturer | Room* |
|---------------------------|----------|-----------------------|--|---------------------|--------------------------|
| Week 1 – Machine learning | | | | | |
| Nov 29 | 9-10 | L | Course introduction | Reese | Mark |
| | 10-11 | L | Introduction to AI, ML and DL | Reese | Mark |
| | 11-12 | L | AI Overview from the AI Lab @ British Antarctic Survey | Hosking | Mark |
| | 13-14 | L | Status of Big Data for Earth System Science | Chen | Mark |
| Nov 30 | 10-12 | L | Introduction to ML algorithms | Reese & Pettersson | Mark |
| | 13-15 | L | Training data, Important variables & Evaluating ML performance | Reese | |
| Dec 1 | 10-12 | S | Article seminar | Reese | Mark, Bohuslän, Atlanten |
| | 13-16 | E | Applying ML algorithms in practice | Reese & Poropat | GISLab |
| Dec 2 | 10-11 | L | Remote sensing and AI | Reese | GISLab |
| | 11-12 | L | Google Earth Engine processing | Kakoei & Pettersson | GISLab |
| | 13-16 | E | Google Earth Engine exercise | Kakoei & Pettersson | GISLab |
| Dec 3 | 9.30-11 | L | Destination Earth and AI Peter Dueben, Peter Bauer, @ECMWF | Pre-recorded | Mark |
| | 11.30-12 | L | Ecotwin | Strannegård | Mark |

¹ L = Lecture, E=Exercise, S=Seminar

Zoom Link

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|------------------------|-------------|------------------------------|---|---|---------------|
| Week 2 – Deep learning | | | | | |
| Feb 7 | 10-11 | L | Introduction to Deep Learning concepts | Reese | Zoom |
| | 11-12 | L | Overview of Deep Learning | Xiong | |
| | 13-14 | L | Deep Learning and Earth system science | Reichstein | |
| | 14-16 | L | Deep Learning algorithms: CNN and RNN | Johansson | |
| Feb 8 | 10-11 | L | Deep Learning algorithms: GAN | Pre-recorded lecture | |
| | 11-12 | L | Cloud processing | Heuzé | |
| | 13-14 | L | Explainable AI | Riveiro | |
| Feb 9 | 10-12 | L | Neural Networks for biology | Andermann | |
| | 13-16 | E | Exercise | Andermann | |
| Feb 10 | 10-12 | L | Deep learning research projects conducted at BAS, the Alan Turing Institute, and University of Gothenburg | Coca Castro, Corcoran, Parthipan, Poropat | |
| | | L | Uncertainty in AI | Jennings – pre-recorded lecture | |
| | | | | | |
| Feb 11 | 10-12 | S | Closing seminar – Future of AI | Students | |
| | 13.30-14 | L | The Poverty Observatory | Daoud | |
| Feb 17 | 10-12 | S | Final presentations | Students | |

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Course Lecturers

Andermann, Tobias – Postdoc, Department of Biology and Environmental Sciences, GU
Chen, Deliang – Professor, Department of Earth Sciences, GU
Coca Castro, Alejandro – Postdoc, the Alan Turing Institute, UK
Corcoran, Evangeline – Research associate, the Alan Turing Institute, UK
Daoud, Adel – Associate Professor, Division of Data Science and AI, Chalmers & Institute for analytical sociology, Linköping Univ
Heuzé, Céline – Assistant Professor, Department of Earth Sciences, GU
Hosking, Scott – Senior Research Fellow at the Alan Turing Institute and Environmental Data Scientist at the British Antarctic Survey, UK
Johansson, Richard – Senior Lecturer, Division of Computer Science and Engineering, Chalmers Technical Univ and Department of Data Science and AI, GU.
Kakooei, Mohammad – Post-doc, Division of Data Science and AI, Chalmers Technical Univ.
Raghul Parthipan – PhD candidate, University of Cambridge, and the British Antarctic Survey, UK
Pettersson, Markus – PhD candidate, Division of Data Science and AI, Chalmers Technical Univ.
Poropat, Lea – Post-doc, Department of Earth Sciences, GU
Reese, Heather -- Associate Professor, Department of Earth Sciences, GU
Reichstein, Markus – Professor, Max-Planck-Institute for Biogeochemistry in Jena, Germany
Riveiro, Maria – Professor, Department of Computing, Jönköping University
Strannegård, Claes – Professor, Division of Data Science and AI, Chalmers Technical Univ.
Xiong, Ning – Professor, Division of Intelligent Future Technologies, Mälardalen University

Course Organizers

Heather Reese (course responsible), Deliang Chen, and Céline Heuzé @ Dept. of Earth Sciences, GU