Information for applicants to the position as professor/associate professor in data management

History and organization — NMBU

NMBU’s history begins with the establishment of an agricultural college at Ås in 1859. The college was promoted to a research college with the right to confer doctoral degrees in 1897. In 2005, we attained full university status, becoming the Norwegian University of Life Sciences, and merged with the Norwegian School of Veterinary Science in 2014, adopting its current Norwegian name and acronym NMBU, Norges miljø- og biovitenskapelige universitet. The veterinary school is currently moving from Oslo to our beautiful campus at Ås.

NMBU has about 6000 students (including over 500 PhD students), 1800 employees (of which 800 in academic positions) and offers 64 study programs. The university is organised into seven faculties:

- Biosciences
- Chemistry, Biotechnology and Food Science
- Environmental Sciences and Natural Resource Management
- Landscape and Society
- School of Economics and Business
- Science and Technology (REALTEK)
- Veterinary Medicine

History and organization — Faculty of Science and Technology (REALTEK)

The faculty was formed in 2005 by merging several institutes and adopted its current name and status in 2017. REALTEK currently has about 150 employees, 70 PhD students and postdocs and 1400 students. There has been a marked rise in student numbers in recent years and the faculty now offers study programs...
across a broad range of engineering disciplines including Data Science, Industrial Economics, Physics and Robotics (five-year integrated master programs, sivilingernőr), and high-school science teacher degrees. We offer both a five-year and a two-year master program in Data Science. REALTEK's main office building was completely renovated in 2018 and further improvements of our facilities are under way. The faculty is organised in seven departments

- Data Science
- Mathematics
- Physics
- Geomatics
- Building and Environmental Technology
- Mechanical engineering and technology management
- Educational Science

REALTEK's strategic goals towards 2023 are

1. REALTEK is a faculty for employees and students with openness and mutual respect, great ambitions, academic freedom, collaboration and community.
2. We educate graduates who are particularly attractive in the job market as they are competent in innovation and the interplay between people, nature, and technology.
3. We contribute primarily to solving selected United National Sustainable Development Goals. We have strengthened research and innovation in applied data science, education and human-centred technology.
4. An effective organisation adapted to our strategy.

The complete strategy document is available on our website.

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**History and organization — Data Science at NMBU**

NMBU and related institutions at Ås, such as NOFIMA, have a long tradition in statistics and data analysis, driven by research within animal breeding, design of experiments, multivariate analysis, chemometrics, and increasingly over the past two decades in image analysis including hyperspectral imaging. These activities are today mainly located in the Breeding and Quantitative Genetics and Genome Biology groups at the Faculty for Bioscience, the Biostatistics group at the faculty for Chemistry, Biotechnology and Food Science, and at REALTEK in the Departments of Data Science, Physics, and Mathematics.
Building on these traditions, REALTEK has been offering a two-year English-language master program in Data Science since the academic year 2017/18, making NMBU the first Norwegian university to offer a Data Science program. From 2018/19, we also offer a five-year integrated Master of Technology in data science (sivilingeniør).

Data science is highly relevant for most other study programs at REALTEK, including the five-year integrated Master of Technology programs (sivil.ing) in

- Industrial economics and technology management
- Geomatics
- Robotics
- Environmental physics and renewable energy
- Structural engineering and architecture
- Water and environmental technology

**About the Data Science department at REALTEK**

Data science at REALTEK is focused on applications, and our research is inspired by the UN Sustainable Development Goals. Our faculty combines a wide range of engineering fields in a single building, facilitating frequent interdisciplinary interactions and joint strategic efforts between data scientists and fields of application. NMBU’s compact and beautiful campus offers many further opportunities to apply data science, especially in biosciences and economics. At REALTEK and NMBU you will never have to walk far to meet colleagues eager to engage in data science research.

Since the spring of 2019, Data Science is established as a department at REALTEK and currently has four faculty members. Two new faculty members with focus on machine learning and deployment, respectively, will join us in coming months. The colleague focusing on deployment is appointed jointly in Data Science and Industrial Economics to strengthen ties between our fields. The department currently hosts four PhD students, one postdoc and a few staff members working on externally funded projects. REALTEK is also about to hire technical staff in scientific data processing who will support data science.

In addition to the position in Data Management currently advertised, the faculty has approved funding for further associate professor positions and two adjunct associate professorships (ethical and regulatory aspect; data security) which will be advertised in the near future.
Faculty members in the Department of Data Science are shown in the table below.

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<tr>
<th>Name</th>
<th>Title</th>
<th>Profile</th>
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<tbody>
<tr>
<td><strong>Hans Ekkehard Plesser</strong></td>
<td>Professor</td>
<td>Brain Simulation Technology; department head</td>
</tr>
<tr>
<td><strong>Kristian Hovde Liland</strong></td>
<td>Assoc. prof.</td>
<td>Multivariate processing and analysis, spectroscopy, machine learning</td>
</tr>
<tr>
<td><strong>Kristin Tøndel</strong></td>
<td>Professor</td>
<td>Multivariate data analysis, metamodelling, cardiac modelling</td>
</tr>
<tr>
<td><strong>Oliver Tomic</strong></td>
<td>Assoc. prof.</td>
<td>Multivariate analysis, machine learning</td>
</tr>
<tr>
<td>From August 2021</td>
<td>Assoc. prof.</td>
<td>Machine learning</td>
</tr>
<tr>
<td>From April 2021</td>
<td>Assoc. prof.</td>
<td>Value-oriented deployment of data science</td>
</tr>
<tr>
<td>Currently advertised</td>
<td>Prof./Assoc. prof.</td>
<td>Data management</td>
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<td></td>
<td>Assoc. prof.</td>
<td>Data science</td>
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<td>Adj. assoc. prof.</td>
<td>Ethics and regulatory aspects</td>
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<td>Adj. assoc. prof.</td>
<td>Data security</td>
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We participate in a range of externally funded research projects, including:

- Human Brain Project: Building a European infrastructure for brain science (Plesser)
- FutureFarm: Tomorrow's digital farming solutions (Tomic)
- PROVIZ: Prostate cancer visualization by MRI - Improved diagnostics using artificial intelligence (Tøndel)
- New Hydrate Management: New understanding of hydrate phenomena in oil systems to enable safe operation within the hydrate zone (Tøndel)
- DeepHyperSpec: Combining spectral and image information in the analysis of hyperspectral imaging data (Liland, Tøndel)
- DigiFoods: Digital transformation in the food industry with online censors, data storage and advanced analytics (Liland).

Other colleagues involved in Data Science or closely related topics at REALTEK include:

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</thead>
<tbody>
<tr>
<td><strong>Ulf Indahl</strong></td>
<td>Assoc. prof.</td>
<td>Multivariate analysis, machine learning</td>
</tr>
<tr>
<td><strong>Ole Elvetun</strong></td>
<td>Assoc. prof.</td>
<td>Optimisation</td>
</tr>
<tr>
<td><strong>Cecilia Futsæther</strong></td>
<td>Professor</td>
<td>Medical image analysis</td>
</tr>
<tr>
<td><strong>Ingunn Burud</strong></td>
<td>Professor</td>
<td>Hyperspectral imaging</td>
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<tr>
<td><strong>Achim Kohler</strong></td>
<td>Professor</td>
<td>Biospectroscopy</td>
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<tr>
<td><strong>Pål From</strong></td>
<td>Professor</td>
<td>Robotics</td>
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A characteristic feature of REALTEK and the Data Science department is a focus on collaboration and mutual assistance, fostered by a high degree of presence in the office. We expect that we will return to regular presence on campus once COVID-related restrictions are lifted and we expect to see you as our new colleague there as well.
Study programs at the Department of Data Science

The department is responsible for two study programs

- five-year integrated Master in Technology/Data Science (300 ECTS)
- two-year English-language Master in Data Science (120 ECTS)

with 25 student places per class in the five year and 20 places in the two-year program. Recruitment to both programs is satisfactory, although we aim to improve the gender balance among incoming students. The first students to complete the two-year program (spring 2019) easily found relevant positions upon completion of their studies.

The department currently offers the following courses

| Code   | Title                                           | ECTS | Lang.
|--------|-------------------------------------------------|------|-------
| DAT110 | Introduction to data analysis and visualisation  | 10   | N     
| DAT121 | Introduction to two-year master program         | 5    | E     
| DAT200 | Applied machine learning                        | 10   | E     
| DAT300 | Applied machine learning II                      | 10   | E     
| DAT390 | Data science seminar                             | 10   | E     
| IMRT100| Introduction to five-year master program         | 5    | N     
| INF120 | Programming and data processing                  | 10   | N     
| INF200 | Advanced programming                             | 10   | E     
| INF221 | Computer science for data scientists             | 10   | E     

Other courses at the faculty especially relevant for data science include

| Code   | Title                                           | ECTS | Lang.
|--------|-------------------------------------------------|------|-------
| INF230 | Data processing and analysis                     | 10   | E     
| INF250 | Image analysis                                   | 10   | E     
| MATH280| Applied linear algebra                           | 10   | E     
| MATH285| Optimization                                     | 10   | E     
| MLA210 | Introduction to Machine Learning applications in finance and technology | 10 | E |
| MLA310 | Matrix Methods for Data Analysis and Machine Learning | 10 | E |

We are planning to revise our course offerings for the academic year 2022/23 together with our new colleagues.

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1 MLA210 from 2021/22; MLA310 offered as MATH310 at present.
Profile for the position

The advertised position shall add competence in data management to our current range of to allow us to cover the complete data science process in our research and our study programs.

Research expectations

You are expected to develop your own research programme, build collaborations across and beyond NMBU and to attract research funding from national and international sources. REALTEK aims to grant junior faculty members one doctoral student position early in their career, but most of our doctoral students and almost all post-docs are externally funded.

Teaching requirements

You will contribute to the development of and teaching in our two- and five-year master programs in Data Science with a focus on topics related to data management. We also expect you to teach introductory courses in data science, including programming, in the long run as part of a course rotation scheme in the department.

Normal course load is 20 ECTS per academic year, plus supervision of master and doctoral students. Most introductory courses are taught in Norwegian, while graduate-level courses in Data Science are offered in English. Student numbers range from around 400 for large undergraduate courses to 30 for advanced courses. As all colleagues in the department are expected to teach courses at all levels, the ability to teach in a Scandinavian language is required (at the latest two years, preferably one year, after starting in the position).

You will also supervise master students. Our master students write a 30 ECTS thesis, usually from January to May of their final year. From 2023, we expect to have about 45 students writing a master thesis in Data Science per year.

Career development

Sabbaticals are usually available after six years with a full teaching load and after four years for women in associate professor positions.

Given sufficient research production and teaching experience, associate professors can apply for promotion to professor in accordance with NMBU’s guidelines for appointment and promotion, Ch. 12.
Research

Your research is in data management, with a focus on data acquisition, quality or provisioning as a crucial step in the data science process in a world moving from models based on individual data silos to models integrating a wide range of data sources while facing strict requirements concerning privacy and accountability. Relevant research topics that would integrate well with research at REALTEK include data acquisition in industry and infrastructures, distributed and federated learning and FAIR data interoperability.

Evaluation process and comments on requirements

Applicants must indicate if they want to be considered for a position as professor or associate professor. All applicants shall provide a research plan indicating which of our focus areas they want to work in and a description of teaching experience and ambitions.

A scientific evaluation committee including external experts will be appointed to evaluate the candidates on academic merit. The committee will provide shortlists for the position and evaluations will be shared with applicants according to rules and regulations for appointments to Norwegian academic positions.

Based on the shortlists provided by the scientific evaluation committee, the hiring committee for the position will invite candidates for trial lectures and interviews.

Comments on requirements for the position

*Doctoral degree in data science, informatics or computer science*

If you obtained your doctoral degree outside Norway, it has to be equivalent to a Norwegian doctoral degree. This is generally the case for doctoral degrees in sciences obtained in one of the 48 member countries of the European Higher Education Area following the "Bologna" qualification framework (EHEA-QF). For more information, please see section 2.4 of NOKUT’s Criteria for general recognition of foreign higher education.

*Scientific achievements in data management*

Your scientific achievements will be evaluated based on your publications in international peer-reviewed journals, in rigorously peer-reviewed conference proceedings, or monographs. Please accompany your bibliography with information about your contributions to multi-author publications, at least for those publications included with your application. To be considered for this position, you must have a record of peer reviewed publications on data management topics. Mere practical experience with data management does not qualify for this position.
**Experience in international and interdisciplinary projects in data management**

Data Science crosses disciplinary boundaries in an international world of research. We expect that you have worked across both scientific and national boundaries.

**Teaching experience in data management**

NMBU follows national guidelines for the educational competence of professors/associate professors, designed to further improve university education in Norway. As part of your application you must provide an overview of your teaching experience and goals following NMBU's guidelines for documentation of teaching competence for associate professor and professor positions, respectively.

**University pedagogics training**

Completed training is an asset. If you have not completed sufficient university pedagogics training, you will be required to do so within two years of starting in your position, in addition to your normal teaching duties.

**Experience in supervision**

Mentoring master and doctoral students is a demanding part of faculty duties, so any documented experience in this is an asset.

**Experience in external project funding**

Writing grant applications and managing funds awarded is an art in itself. Experience either as a PI or as a junior project member assisting a PI in crucial parts of project acquisition or management is therefore considered useful. In the latter case, a statement of pertaining PIs about your role in projects would be valued.

**Ability to engage students and colleagues**

We expect you to be excited about Data Science and to convey that excitement through innovative teaching and research ideas.

**Drive to build interdisciplinary projects**

As a faculty member, you are expected to create your own research area and team in collaboration with others. We expect you to have the necessary motivation and engagement.
Excellent spoken and written English

You will be teaching in English, so we expect you to speak English at least as well as your (non-native-English speaking) students.

Ability to disseminate research results

Dissemination is an important part of academia, so you should be able to explain your research to school classes, journalists or politicians. You are welcome to include links to material you have published.

Fluency in Norwegian, Danish or Swedish

Within a year, at the latest two years, after starting with us, you must be sufficiently fluent in Norwegian to teach Norwegian-language courses (Danish and Swedish are fine provided the Norwegian students understand you well enough). This requirement is by no means meant to discourage applicants who do not speak Norwegian yet, and we will support you in learning Norwegian if necessary. However, you should reflect carefully about whether you will have the motivation, determination and talent to learn Norwegian well within a year. While the time limit may seem demanding, our experience is that a successful start in a new language depends crucially on a determined effort at the very beginning.

We expect that applicants who have lived in Norway, Denmark or Sweden for more than two years will be able to hold their trial lecture in Norwegian, Danish or Swedish. For candidates who never have lived in Norway, Denmark or Sweden, we will assess your potential to learn and teach in Norwegian within a year based on your fluency in English if English is not your native language, and otherwise based on your fluency in a foreign language that you (and we) speak, such as French, Spanish or German.

Further information

For more information, please contact

Prof Hans Ekkehard Plesser
Department Head Data Science
hans.ekkehard.plesser@nmbu.no
+47 6723 1560

For information about moving to and working in Norway, please see
