dScience – Centre for Computational and Data Science

Annual Report 2023

UNIVERSITETET I OSLO

dScience
Centre for Computational and Data Science

Enabling interdisciplinary collaboration within computational and data science at University of Oslo, supporting long-term research and connecting academic research with industry and the public sector.

Content

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About dScience

dScience – Centre for Computational and Data Science - at the University of Oslo connects academic research with industry and the public sector, manage and share data for research and innovation purposes, and provides direct support into long-term research tasks. The centre's work includes building interdisciplinary collaborations, services to research community, data science analytics and support, and support into education programs. The centre's aims are to:

- Enhance the University of Oslo's scientific standing in computational and data science
- Contribute to the education of tomorrow's workforce
- Contribute to the general knowledge base of society
- Contribute to creation of profitable jobs in industry and the public sector
- Contribute to securing a sustainable future for all

Highlights 2023:

Partner Program

Close collaboration with seven key strategic partners and five thematic working groups to connect academic research with industry and the public sector in Norway.

Twin Transition

Published Twin Transition Insight paper that's a cornerstone of dScience's work in 2023 and will continue to be so throughout 2024.

DSTrain

New EU-funded postdoctoral program that will add 36 new data science positions at UiO.

Data Science Day

Data Science Day gathered over 500 participants from academia, business, and the public sector.

dScience Community

dScience Community gathered over 1800 participants across 30 meeting places and events in 2023.

Data Science Analytics Group

Supported several research projects with computional and data science.

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dScience's Role and Development

dScience's role is summarised as follows:

- Build and further develop internationally leading research within computational and data science at the University of Oslo.
- Deliver significant contributions to the green transition of society and industry.
- Develop groundbreaking collaborations between academia, businesses, and public sector entities, including being a key contributor to the development of Oslo Science City.

To address these tasks, the centre works on:

- Developing various digital and physical meeting places and networks (national and international) for students, researchers, and partners.
- Offering "data science support" with advanced programming, high-quality data handling, and utilisation of green computing power.
- Developing projects with participation from a wide range of academic environments across departments and faculties at the University of Oslo, research institutes, businesses, and public sector entities.
- Developing the dScience Partner Program with actors from society and industry.
- Contributing to education of undergraduates and graduates as well as courses for people in industry and public sector (life-long learning).

The Field Computational and Data Science

Computational and data science encompass current areas such as machine learning, artificial intelligence, digital twin technology, knowledge representation, language technology, logic, statistics, computational mathematics, robotics, image and signal analysis, sensor development, as well as contributions from various disciplines within natural sciences, social sciences, law, and humanities. Computational and data science are widely applied in society and industry. Currently, dScience research activities in computational and data science towards the following areas; i) medicine and health, ii) energy and climate, iii) ocean and space, iv) communication and mobility, v) safety and preparedness, and vi) banking and finance.

Primary Mission

dScience's primary mission is to advance fundamental, long-term research within data and computational science across various disciplines and sectors. Nonetheless, these areas attract significant interest from the business community and public sector bodies. The engagement with clusters, businesses, and public sector units is substantial and has also shaped the activities in 2023, during which dScience set up an innovative and distinctive partnership programme involving participants from the Norwegian business community and the public sector.

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dScience After Three Years

dScience was established in 2021 by the Faculty of Mathematics and Natural Sciences. The plan for the development of the centre outlined that the first two years (2021-2022) should primarily focus on the consolidation of the organisation, while the last three years (2023-2025) in the first 5-year period should focus on the development and growth of the centre's activities. This annual report for 2023 will outline how dScience activities and growth take place.

Strategic Phases for Centre Development: Consolidation and Growth (2021-2025)

By the end of 2023, dScience – the Centre for Computational and Data Science (hereinafter simply dScience) has been in operation for three years. The centre has completed phase one and moved into second phase.

Recap of Phase One

Phase one made clear and solidified dScience's role in research projects and its relationship with the institutes. dScience is a forum for knowledge exchange and cross-disciplinary collaboration, capable and encouraged to initiate significant interdisciplinary projects and processes, such as the development of Centres for Research-based Innovation (SFI), Centres of Excellence (SFF), major EU programmes, etc.

Phase Two

Following two years dedicated to publicising and establishing the centre at the University of Oslo, dScience moved into the second phase of its initial centre period in 2023, focusing primarily on the development and establishment of activities, applications, and projects.

From this, we would particularly like to highlight:

1. The application process and the award of the DSTrain programme for 2024-2028. DSTrain is managed by dScience at the Faculty of Mathematics and Natural Sciences at the University of Oslo (UiO). It is partly funded by the EU Horizon Europe under the Marie Skłodowska-Curie Action (MSCA) - Co-funding of Regional, National and International Programmes (COFUND).
2. The application process and establishment of the TwinEnergy initiative.
3. The assumption of UiO's project responsibility for the NFR project Innovation Roadmap and hosting the UiO part of the Centre for Digital Life Norway (work package on communication and innovation).
4. The launch of the SFF Integreat, where dScience has an important supporting role.

In addition to the efforts around establishing research projects together with research groups across UiO and partners, the main activity in 2023 has been our work on developing partnerships with some of our main target groups. In March 2023, dScience launched the dScience Partner Program, with six strong societal actors involved from the start: Norwegian Bank Investment Management (NBIM), DNB, DNV, Equinor, Kongsberg Gruppen, and South-Eastern Norway Regional Health Autority (Helse Sør-Øst). At the end of 2023, the Partner Program also welcomed City of Oslo as new partner.

The dScience Partner Program is the University of Oslo's collaboration with participants from Norwegian businesses and the public sector. The program was established to develop and carry out projects, as well as to engage in long-term capacity building in areas that are particularly important for Norway.

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Roles and Tasks

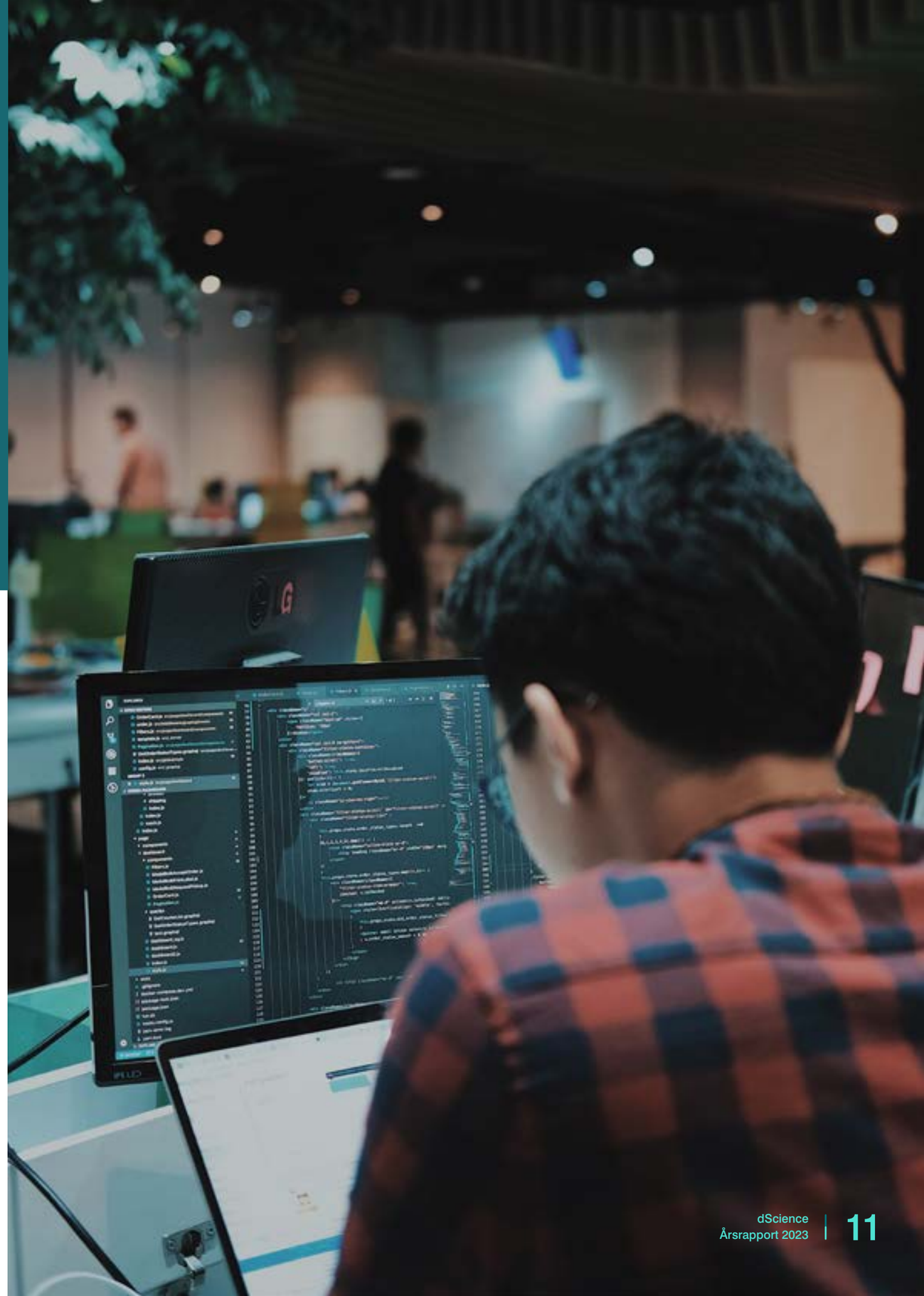
The dScience Board (listed in the last part of the annual report) has overall responsibility for dScience's priorities and strategy. dScience organises its work based on four units, led by Centre Leader and Professor Morten Dæhlen, Deputy Leader and Professor Ingrid Kristine Glad (until 30.08.23) and Professor Arne B. Huseby (from 01.09.23). The four group units have clear areas of responsibility:

1. Office and Community Services
2. Data Science Analytics
3. The dScience Partner Program
4. Project Development

For dScience operations, two councils have been established – the dScience Council and the dScience Community Forum – appointed by the dScience Board. The advisory council serves as the centre leader's advisory group and has 10 meetings a year and remaining 12 professors from UiO participating in the council. The community forum works on the development of measures and mechanisms for increased interaction across disciplines and units at UiO, focusing on application and project development among the forum's members. The members of the advisory council and the collaboration forum, appointed for the period 2021-2023 are listed at the end of the report.

dScience is located in the Kristine Bonnevie building at Blindern with 18 office spaces, as well as a lounge/meeting area that can accommodate up to 40 visitors. The office community consists of the dScience administration, the NORA secretariat, as well as UiO's employees at Centre for Digital Life Norway (DLN). In the spring of 2023, dScience expanded its office facilities at the Oslo Science Park. Together with the three initiatives UiO Growth House, UiO:Energy and Environment, and UiO:Life Science, dScience has 10 office spaces and meeting room facilities in the Oslo Science Park. These are primarily used by the dScience Partner Program and the DLN innovation team.

Through the Oslo Science Park, we gain access and proximity to a larger environment for start-ups, business, and units at Oslo University Hospital, as well as meeting and event facilities. Dual-location has its advantages with flexible free seating and various arenas for reaching dScience's target groups, but it is also challenging for cross-collaboration among employees and teams within dScience.



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Office and Community Services

Office and community services include all coworking spaces, events, networking and communication efforts and services within dScience.

Achieving the objectives of dScience relies on the effectiveness of both internal and external communication.

A significant aspect of the centre's internal and inreach communication work involves facilitating dialogues, collaborations, and processes by providing leadership support and secretarial functions.

The centre's activities are communicated through carefully selected strategic channels. Our main online communication channel is the dScience website where we share information about the centre, relevant projects, research, activities, and news in Norwegian and English.

New Research Project Overview

An essential task for dScience is to showcase existing projects at UiO within the field and facilitate new project collaborations. Therefore, an important goal for 2023 was to create an easily accessible research project overview on the dScience's website. Together with USIT, we now have tailored and published a solution for the project database in accordance with UiO's website guidelines, which can be found on the website. There are still projects to be added to this overview, but this is well underway.

Social Media

dScience has an active LinkedIn page that is experiencing a significant increase in number of followers. The total number of followers is now over 1000, where more than 500 of these has started to follow dScience since the summer of 2023. This indicates that the centre's activities are meeting the interests of the target groups.

Newsletter

To combine both internal communication at UiO and external communication to the centre's collaborators and supporters, we have sporadically published newsletters in 2023, in addition to weekly event invitations. We plan to increase the number of newsletters in 2024 and publish them more regularly. The newsletter now has more than 1400 subscribers.

In addition, we have started a bi-monthly newsletter exclusively for the members of the dScience Partner Program to communicate relevant activities and progress (read more about the Partner Program here).

Communication Support

dScience is providing communication support to the newly established Centre of Excellence, Integreat - Centre for Knowledge-driven Machine Learning. We assist with Integreat's website, social media, and communication of other activities, including news production.

dScience also assists the new COFUND, DSTrain (Data Science Training), with website development, content and communication, social media, and marketing of positions.

In addition, dScience works closely with UiO's central communication, the Faculty of Mathematics and Natural Sciences, and collaborate with Oslo Science City on various relevant activities and joint efforts.

Creating Meeting Places

Another central part of dScience's mission aims to create meeting places both physically and digitally. During the initial operational years, we have prioritised establishing meeting spaces at both local and national levels.

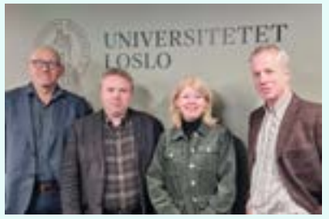
dScience has established five regular meeting places, including a weekly academic lunch for PhD and postdoc candidates in the dScience lounge, a monthly lunch seminar at the Science Library open to everyone, webinars on digital resources, and an annual "Data Science Day" in October. In 2023, Data Science Day @ UiO gathered over 500 participants from academia, business, and the public sector, with record participation and 20 corporate stands. We continued the "dScience Breakfast Club", regular breakfast meetings for established researchers and experts in specific fields and methods. Additionally, dScience serves as a host and collaborator for various individual events, expert meetings, and conferences.

One of the highlights for dScience in 2023 was undoubtedly the high-level conference Nordic Perspectives in AI 2023. Nordic Perspectives is part of a series of collaborative conferences in the Nordic countries, with specially invited participants from technology-leading businesses and research environments, public sector and political leadership. The Oslo conference was organised by Schibsted, The Confederation of Norwegian Enterprise (NHO), SINTEF, University of Oslo (dScience) and Oslo Science City, in cooperation with Kaya Partners. The purpose of the conference is to create a common knowledge base and collaboration platforms, as well as clarify common challenges and opportunities within research and business in the Nordic countries. Over two days in Domus Bibliotheca we gathered over 100 leaders from technology companies, research environments and the public sector from the Nordics for discussions and collaborations on the possibilities for strengthening Nordic cooperation within artificial intelligence.

In total, we recorded over 1800 participants across 30 meeting places and events in 2023:

Lunch seminars in the lounge	**Spring**: 10 **Fall:** 5 Number of participants varies between 20-40
Lunch seminars in the Science Library	**Spring:** 4 **Fall:** 2 Number of participants varies between 55-105
Webinar	**February 1:** FAIRmat – Making Materials Data Findable and AI Ready, Claudia Draxl and Christoph Koch from Humboldt-Universität zu Berlin Approx. 40 participants on Zoom
Breakfast Club	**January 17:** Machine Learning and Causality pt II (Geir Kjetil Sandve (Professor, Biomedical Informatics Research Group) and Johan Pensar (Associate Professor, Statistics and Data Science)) **March 13:** How to succeed with partnerships between academia, business and the public sector? (David Cameron and Morten Dæhlen) **April 25:** Data Science for Good (Morten Dæhlen (Centre Manager, dScience) and Kristin Braa (Prof. Centre Director, HISP)) Number of participants: approx. 45
Other	Partner Program Launch (100 participants) Data Science Day (500 participants) Nordic Perspectives (100 participants) Twin Transition Breakfast Seminar (100 participants) dScience Synthetic Data Generation Workshop (60 participants)
Total events	30

Office and Community Services



Lunch seminars:

Date	Place	Speaker	Title
Feb 2	Lounge	Lars Ødegaard Bentsen (PhD Candidate, Department of Technology Systems)	Using machine learning to improve energy utilisation for offshore wind turbines
Feb 9	Lounge	Ghadi S. Al Hajj (PhD Candidate, Department of Informatics)	Incorporating Prior Domain Knowledge into Deep Learning Models: A Case of Disease State Prediction
Feb 16	UB	Are Raklev (Professor, Department of Physics, and member of GAMBIT) and Anders Kvellestad (Postdoctoral Fellow, Theoretical Physics, and leader of GAMBIT)	Mapping the microcosm - Searching for new laws of physics with fast computational methods
Mar 9	Lounge	Aleksander Grochowicz (PhD Candidate, Risk and Stochastics)	Near-Optimal Planning of Renewable Energy Systems
Mar 16	Lounge	David Samuel (PhD Candidate, Research Group for Language Technology)	Large language models: how to train them and why is it so inefficient
Mar 23	Lounge	Zhi Zhao (Postdoctor, Department of Cancer Genetics, Oslo University Hospital)	Tissue-specific identification of multi-omics features for pan-cancer drug response prediction
Mar 30	UB	Alexander Jensenius (Professor of music technology at the University of Oslo and Director of RITMO Centre)	Rhythmic Data Science
Apr 20	UB	Anne Solberg (Professor, Research Group for Digital Signal Processing and Image Analysis)	Learning from Image Data
Apr 27	Lounge	Henri Pesonen (Researcher, OCBE, Institute of Basic Medical Sciences)	Accelerating ABC SMC
May 4	Lounge	Arash Ahmadi (Senior Engineer, dScience)	A Case Study of Exploratory Data Analysis - Insight Oslofjord
May 11	UB	Bjørn Høyland (Professor / Head of Studies, Department of Political Studies)	Political Data Science
May 25	Lounge	Theophilus Quachie Asenso (Postdoctoral Fellow, Oslo Centre for Biostatistics and Epidemiology)	Modeling high-dimensional interaction problems with the pliable lasso

Date	Place	Speaker	Title
Jun 1	Lounge	Dhananjay Tomar (PhD Candidate, Research Group for Digital Signal Processing and Image Analysis)	Processing Giga-Pixeled Images
Jun 8	Lounge	John Aiken (Researcher, NJORD Centre for Studies of the Physics of the Earth)	Constraining Peridotite Alteration Rates with AI and ML
Sep 7	UB	Andrey Kutuzov (Associate Professor, Research Group for Language Technology)	Large language models under the hood: artificial neural networks and who they belong to
Sep 14	Lounge	Harish Jain (PhD Candidate, Condensed Matter Physics, Njord)	Active reorganization of tissues: Phase transition of ideas from physics to biology
Sep 21	Lounge Partner	Trung-Duy Nguyen (Lead Data Architect & Engineer, DNB)	DNB's ESG Hub: facilitating the integration of ESG factors into the investment process
Oct 12	UB	Anders C. Hansen (Professor, Faculty of Mathematics, University of Cambridge)	On Smale's 9th problem, generalised hardness of approximation and the limits of AI
Nov 2	Lounge	Sigbjørn Løland Bore (Postdoctoral Fellow, Hylleraas Centre for Quantum Molecular Sciences)	Learning forces and energies of atoms by active learning
Nov 9	Lounge	Marianne Etzelmüller Bathen (Researcher, Centre for Materials Science and Nanotechnology Physics)	Quantum computers: How they work and how to make them
Nov 16	Lounge	Olivier Lartillot and Lars Monstad from RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion	Computational music analysis: Significance, challenges, and our proposed approach
Nov 23	Lounge	Finn Upham, Postdoc, RITMO Centre for Interdisciplinary Studies in Rhythm, Time and Motion	Measured in concert: Constraints and opportunities in studying complex musical behaviours

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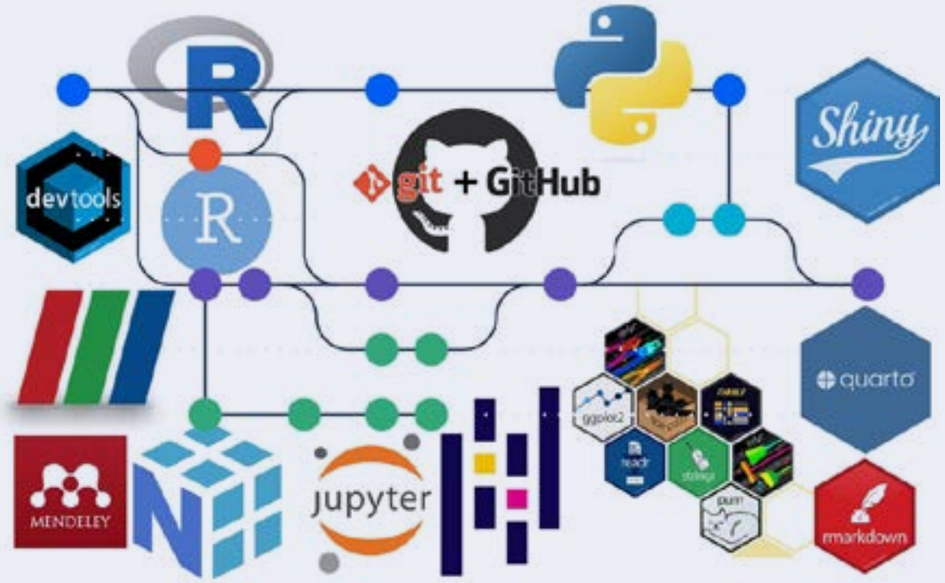
Data Science Analytics



Accelerating integration of data science in research projects

The core mission of the Data Science Analytics Group is to accelerate the integration of data science technologies – including data management, high-performance computing, machine learning, artificial intelligence, and interactive data analysis into research projects. We have a close collaboration with the IT Department at the University of Oslo (UiO) in the application of the existing infrastructure and knowledge around data and computational science.

Our aim is to bolster competitiveness and increase productivity of the researchers at UiO as well as among our dScience partners. In support of this vision, we concentrate our expertise and resource on two primary areas:

1. **Targeted courses and workshops** on the commonly encountered challenges by researchers
2. **Direct involvement** in data and computational science aspect of research projects

Courses and workshops

Most of the courses and workshops are developed upon encountering commonly raised issues by researchers. These workshops are tailored to address the current challenges researchers are facing. Here is a list of workshops that are regularly held by Data Science Analytics group (the list will be evolving as we are preparing material for more workshops):

- Version control using Git and GitHub
- Project management for PhD students
- Building packages in R
- Building packages in Python
- HPC data visualisation using ParaView
- Introduction to modern tools and packages in R

The workshops are open to all PhD students, Postdoc and researchers within the Faculty of Mathematics and Natural Sciences.

Direct involvement in research projects

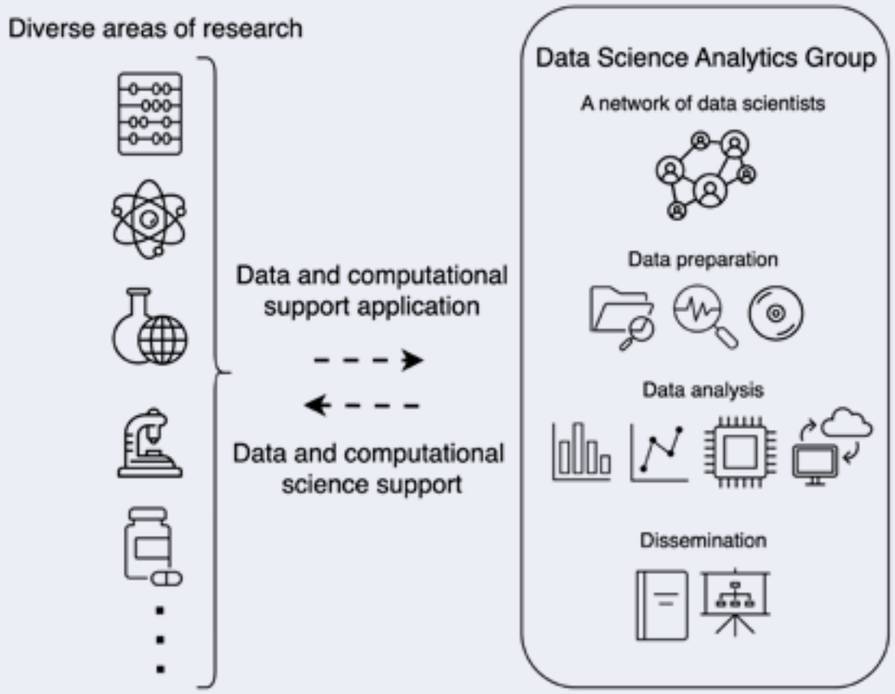
Every year around April, dScience issues a support call where research groups within the Faculty of Mathematics and Natural Sciences can send us a structured application describing the current data and computational challenge the groups face. Depending on the scope of the current challenge and its relevance to our team's expertise and capacities, we assess the possibility of granting the support. Once the support project is deemed feasible, we collaborate with research groups to design an action plan to tackle the challenge at hand. The scope of this support is categorized in three main pillars: "**Data preparation**", "**Data analysis**" and "**Dissemination**" with detailed sub-categories as follow:

Data preparation

- Data storage and access (systematic storage and sharing of data)
- Big data (challenges with storage and backup and memory for processing)
- Data organization and management (need to develop a system)
- Data pipeline and automation (use the data efficiently and effectively in pipeline)
- Data wrangling and transformation (prepare and structure data for analysis)

Data analysis

- High performance computing
- Programming support (need limited programming support on particular issues)
- Prototyping and implementation (turning your idea into a model)
- Statistical data analysis (you know what but don't know how)
- Machine learning (from brainstorming on ideas to implementation and interpretation)
- Exploratory data analysis (need to explore and understand your data)



Dissemination

- Data visualization and communication (effective visualization of results for publications)
- Platform development (turning code to packages and graphical user interface)

The following is a list of projects that the team have been working on in 2023:

1. **Trude Storelvmo and Pål Erik Isachsen – Department of Geosciences**
   - Field: Atmospheric Sciences
   - Context: The project is about developing an interactive visualisation tool for global observational and model data. The developed tool allows for effective and informative visualisation of large climate datasets.

2. **Tor Ole Odden – Physics Department**
   - Field: Physics Education and Science Education Research.
   - Context: The project is about application of natural language processing as a tool for qualitative data analysis in science education.

3. **Gert Werner Kluge and Heidi Sandaker – Physics Department**
   - Field: Astroparticle Physics
   - Context: The project is about application of neural networks in simulation-based investigations of gamma-ray astronomy and fundamental particles.

4. **Bjørn Dalhus – Medical Biochemistry, Institute for Clinical Medicine**
   - Field: Molecular Biology
   - Context: The group has an in-house developed analysis platform for detection and quantification of DNA-scanning. They have approached us to develop the existing platform into a R package and publish it as an open source tool.

5. **Désirée Treichler – Department of Geosciences**
   - Field: Remote Sensing of Snow
   - Context: The project is about application of modern data management tools in efficient access and transformation of snow depth data from different sensor and data sources.

6. **Marianne Zeyringer – Department of Technology Systems**
   - Field: Energy Systems Modelling
   - Context: The project is about providing expert support in the process of software development. The areas of support can include code and data management, usage of Fox, Educloud and Version Control.

7. **Daniel Naurin – Faculty of Social Sciences - ARENA Centre for European Studies**
   - Field: European Studies
   - Context: The project involves cleaning a large corpus of text data, with older judgements from the Court of Justice of the EU. The data is primarily in the form of PDF images of old documents which introduces a significant amount of error in the OCR process.

8. **Innsikt Oslofjord – Institute of Marine Biology, Kongsberg Maritime and Inspiria Center**
   - Field: Environment Preservation – Frisk Oslofjord II
   - Context: The project is about collection, management, analysis and dissemination of the data from “Rognfjell” boat project in the context of the Frisk Oslofjord II project.
   - Progress: All the sensor data from “Rognfjell” boat along with records of observation from “Dugnadforhavet” website are collected in Educloud. The data is pre-processed on Fox and Educloud and visualised in a form of an R Shiny application on an online server which provides an interface for interaction with the data through this address: innsikt-oslofjord.educloud.no

9. **Lander – Institute of Marine Biology, Kongsberg Maritime**
   - Field: Environment Preservation – Frisk Oslofjord II
   - Context: The project is about collection, management, analysis and dissemination of the data from “Lander” observatory complex in the context of the Frisk Oslofjord II project.
   - Progress: All the data collected from the “Lander” observatory complex are transferred to Educloud and processed there. The result will be published as a separate tab on “Innsikt Oslofjord” website.

10. **Signature method – Fred Espen Bent – Mathematics Department and Norges Bank Investment Management - Advanced Impact Study**
    - Field: Mathematical Finance
    - Context: The project is about market event/sector classification with regression based analysis using signature method.
    - Progress: In the first phase we have developed a variety of price time series simulators and implemented a classification model using signature method.

11. **Norwegian AI Cloud (NAIC)**
    - Field: Artificial Intelligence and Machine Learning
    - Context: NAIC is a project designed to establish powerful AI/ML infrastructure in Norway. dScience is currently supporting this project by contributing to one of its work packages related to training and support.
    - Progress: dScience involvement primarily revolves around developing High-Performance Computing (HPC) visualisation setup under the NAIC context. This aspect is vital for researchers handling extensive datasets, as it can enhance their ability to analyse and interpret complex and large datasets more effectively. Additionally, we are committed to creating comprehensive training materials and providing dedicated support. These resources assist researchers in fully harnessing the capabilities of the NAIC’s state-of-the-art infrastructure.

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dScience Partner Program

The partner program is the primary mechanism for dScience's engagement with business, public administration and the third sector. Here, leading businesses and organisations have chosen to enter a collaborative partnership with the university to deepen research and innovation collaboration.

Objectives of the partner program:

- Create and enhance value from digital resources.
- Provide strong contribution to the green – and twin – transition.
- Contribute to the creation of profitable jobs.
- Take and develop an international position in selected domains and topics.

The program started with six partners: DNB, DNV, Equinor, Kongsberg Group, Norges Bank Investment Management (NBIM) and South-Eastern Norway Regional Health (Helse Sør-Øst). City of Oslo became a partner in December.

Our partners now cover a broad area of business and public administration. The centre is actively in dialogue with new partners, especially in areas that complement our existing partners. In 2023 we had 10-15 business meetings and presentations of dScience Partner Program to interested units and companies in Norway.

The partner program is supported by a group of External Engagement Advisors. As of December, we have three full-time advisors employed: David Cameron (manager), Laura Slaughter and Nilla Karlsen-Davies. All three have a researcher background and experience from external university-industry collaboration.

The role of External Engagement Advisor is novel at the University of Oslo and is being developed in the context of the partner program. The role is to act as a bridge builder between partners and the researchers at the university.

This team has been supported by two part-time senior advisors, Keith Lewis and Leif Næss. Both are experienced senior managers with decades of industrial experience. The program is supported by the dScience administrative team and a newly employed communication advisor, Christoffer Hals.

The program activities in 2023 have focused on building up places where partners and academics can meet to share competence and build up project ideas. The primary tool for this is Thematic Working Groups. These have had various forms – some have been exploratory – while others have worked directly towards obtaining external funding.

During the year, we have worked on defining the Advanced Impact Study as a form for project in dScience. We have seen that there will be different types and sizes of AIS, depending on the aim, timescale and complexity of the task. In 2023, we started with small AIS studies where NBIM collaborated with the Department of Mathematics and the dScience Technical Support team on a scoping study for a new algorithm. Our ambition in 2024 is to agree on contracts that allow us to set up and run AIS projects quickly and reliably.

Theme	Activities in 2023
Enhanced production and use of renewable energy	A workshop with more than 50 participants was held to define a research agenda for the twin transition, digital and green, of energy production, transportation and consumption. This agenda will be used to define projects and funding proposals in 2024.
Sustainable risk management (with focus on climate risk)	The working group was set up in autumn 2023 and will meet again in January 2025. The group has proven to be a forum for sharing concerns and competence between partner companies.
Asset modelling and optimisation	The working group for this important topic will take over the role of the SIRIUS Centre after the conclusion of that centre in November 2023.
Resource efficiency in healthcare	Laura Slaughter has prepared a position statement on data science in healthcare operations. We are finalising an Advanced Impact Study with Helse Sø r-Øst for completion in 2024.
AI Safety	NORA and dScience have set up a national working group on AI Safety and a Norwegian response to the EU AI act. This started with a workshop co-hosted by NUPI in November 2023. We plan to follow this up with a delegation to the UK in April 2024.

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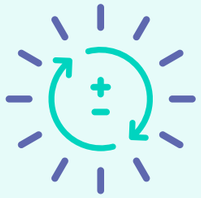
Research and Project Development



dScience is a crucial initiator and key supporter for project applications and project development at the University of Oslo.

dScience is particularly set up for running projects like this where the candidates from a diversity of research groups across the university can meet for project development, seminars, discuss science and socialise. The outreach activities at dScience are also arenas where industry and public sector can meet future employees. These outreach activities cover the popular Data Science Day, monthly science seminars at the Science Library and weekly meetings in the dScience lounge.

Following you can see an overview of important research projects where dScience is involved or is the project owner.

Charting a Path towards a Green and Digital Tomorrow: Embracing the Century of the Twin Transition

In times where digital innovation is crucial and environmental challenges are increasing, it's important to understand and merge the digital and green transitions. This significant issue is also known as the "Twin Transition", a key strategic priority for Europe. It denotes the intertwined Green Digital Transition, pointing to the need to ensure that the digital revolution contributes to a successful green transition.

The concept of the Twin Transition has been a cornerstone of dScience's work in 2023 and will continue to be so throughout 2024. Centre Director Morten Dæhlen has highlighted a path forward via The Guild's Insight Paper, "The Twin Transition Century: The role of digital research for a successful green transition of society?" which was presented in Brussels in September 2022. The paper offers strategic guidance for policymakers, funders, and educational institution; advocating for increased investments in the digital transition to empower society with the necessary tools and capabilities to successfully navigate and adapt to the green shift.

dScience brings together leading researchers and experts in data and computational sciences to tackle big societal challenges. A consortium of 32 leading researchers, nine international, and 15 Norwegian private and public sector partners has been formed to develop a vision for the centre for The Twin Transition in Energy (TwinEnergy). A funding application for a Societal and Industry-oriented Research Centre (FME) was submitted to the Norwegian Research Council in November 2023 to realise this vision. The funding application has a total budget of 400MNOK. TwinEnergy is dedicated to playing a substantial role in the energy transition, aiming for net-zero greenhouse gas emissions in Europe by 2050. Its goals include enhancing the energy system's capacity for renewable energy integration and employing data-driven strategies and digital tools to engage stakeholders across the board.

In the autumn of 2023, we planned and developed activities for 2024:

- The UiO Energy Conference "The Future of Energy is Green and Digital" on 10th-11th January 2024: Bringing together knowledge communities in Oslo Science City with key figures from academia, industry, and politics to envision the future energy landscape.
- A Norwegian "Safety of AI" delegation to London, United Kingdom in March 2024 to foster cross-border partnerships, share best practices, and facilitate knowledge transfer in the areas of artificial intelligence, the twin transition, and research-driven innovation.
- A dScience and INTRANSIT workshop on the Twin Transition in autumn 2024 will explore the collective action required for a sustainable shift, offering diverse perspectives from different disciplines. Co-organisers include SINTEF Digital.

DSTrain – Creating the next generation data scientists and AI experts

The University of Oslo has long engaged with data science, artificial intelligence (AI), and machine learning. With the global and local demand for data scientists surging, we are excited to launch a new EU-funded postdoctoral program that will add 36 new data science positions at our university.

The programme has the title, Data Science Training (DSTrain) and the first 18 positions will be announced in January 2024 with application deadline 14. April 2024. The second call for applications for the positions will be in 2025 hiring another 18 candidates in the projects. The timeframe of the project is from 2024 to 2028/29.

The programme is organised by dScience. The candidates will be located in research groups across the Faculty of Mathematics and Natural Sciences with dScience as their common meeting place/hub.

DSTrain has a particular focus data science supporting the green transition of society. Read more about that here.

The topics for the first call in DSTrain are listed on the project homepage in the announcement of the positions.

Training actions

As the title of the programme says, this is about training of the next generation data scientist, hence we will during the lifespan of the project have numerous training seminars and workshops. The program will train researchers and innovators with disciplinary, interdisciplinary, and transferable skills and a foundation in data science methods enabling them to become Europe's digital leaders across disciplines and sectors.

Partners

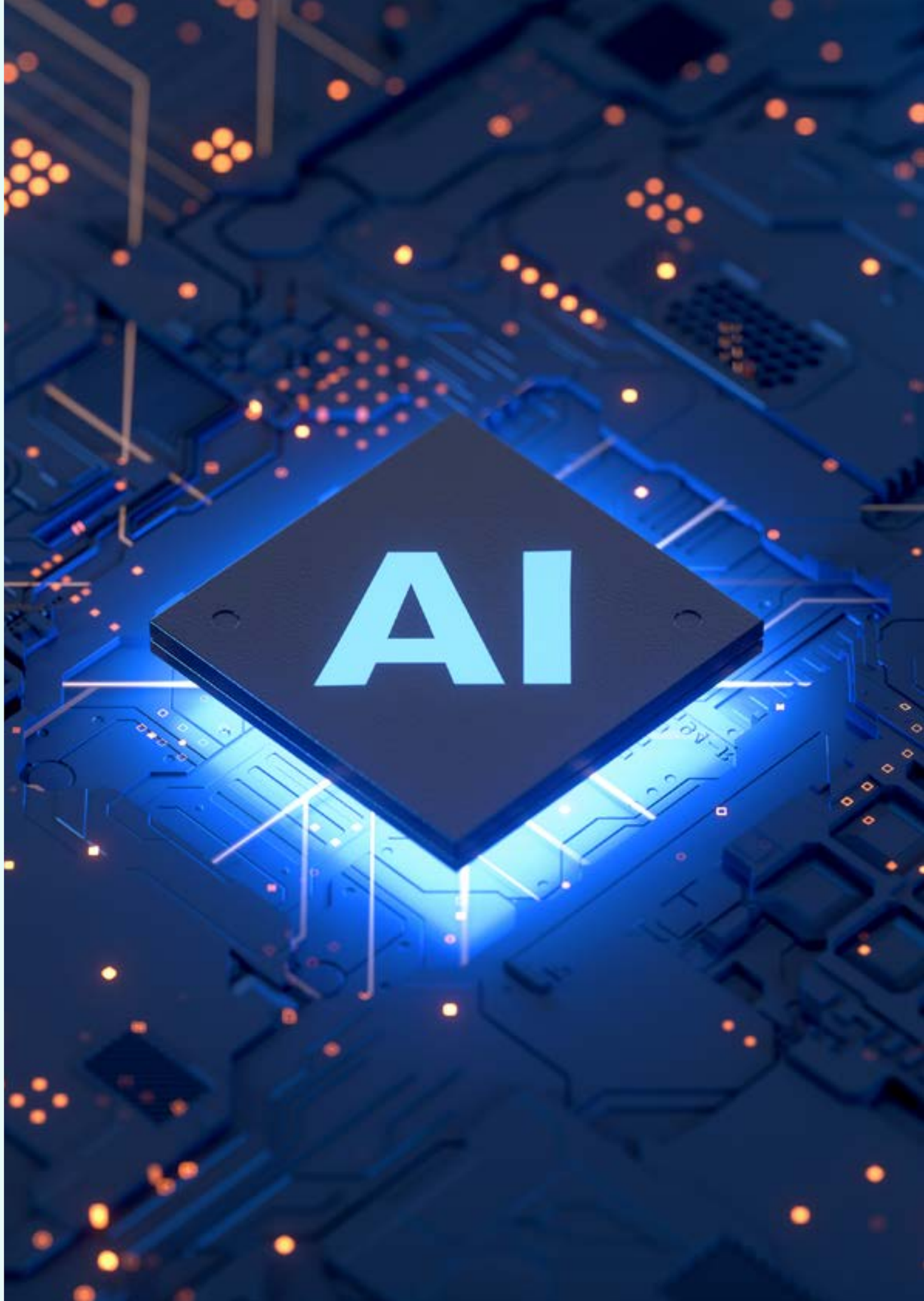
Moreover, the projects within the programme have numerous partners, research institutes, industry, hospitals, and other units in public sector in Norway and in particular in the Oslo region. These partners are important as they will provide internships and carrier mentoring for the candidates. The project, in particular the seminars and workshops, are also important arenas for future recruitment of data scientists.

Other research activites

dScience participated in a project with the The Norwegian Biodiversity Information Centre (Artsdatabanken) to develop knowledge resources for a TraitBank. This is a knowledge source for describing, connecting, and displaying data on species and nature type traits. Species' trait data is used for knowledge-based conservation and research. The project is also a catalyst for biodiversity digital twin project scoping activities.

dScience's scoping activities related to biodiversity digital twins have been:

a. ontology engineering within the Oslofjord Klimabarometer project headed by Professor Einar Broch Johnsen
b. development of a use case that will provide a test of real-time data integration (eDNA collection, acoustics, high-throughput imaging systems, use of planktoscopes, and Continuous Particle Imaging Classification-CPICS), of the Skagerrak/Kattegat area together with UiO Informatics, UiO Biosciences, SINTEF, and the University of Gothenburg.
c. preparation towards a biodiversity digital twins research program to address needs for AI tools for participatory management by stakeholders, policy scenarios assessment, development of "what-if" scenarios, with the recent focus on invasive species management.



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Hosting Centre of Digital Life Norway and NORA

NORA

The University of Oslo (UiO) hosts the national consortium NORA – Norwegian Artificial Intelligence Research Consortium, and dScience is assigned the responsibility for the secretariat. The centre leader has employer responsibility for the general manager Klas Pettersen, and dScience assists NORA with various administrative tasks. The collaboration with NORA is extensive, and there are good academic synergies and cooperation between the staff working on the development of dScience at UiO and those working in the NORA secretariat. Read NORAs annual report for 2023 here.

Centre for Digital Life Norway

From August 2023 dScience also hosts the administrative UiO staff that works for Centre for Digital Life Norway. Centre for Digital Life Norway (DLN) is a national centre for biotechnology research, education and innovation. The centre facilitates transdisciplinary collaboration across institutions, fields of research and the research projects in the centre.

The centre is a collaborative project between the Norwegian University of Science and Technology (NTNU), the University of Oslo (UiO), the University of Bergen (UiB), the Norwegian University of Life Sciences (NMBU), Oslo University Hospital (OUS), SINTEF and UiT the Arctic University of Norway. The centre is run by a competence hub and includes a research school and research projects. The competence hub is funded by the Research Council of Norway, and the second funding period DLN 2.0 started in February 2021.

In addition to hosting DLN we also became the project owner of the DLN project: A roadmap for academic research-intensive innovation, funded by Research Council of Norway.

In 2019 DLN and UiO was granted NOK 30 million from the Research Council of Norway to run the 5-year innovation project “A roadmap for academic research-intensive innovation”. The objective of the project is to design and initiate a change process in the Norwegian innovation system with the aim of increasing innovation from academic research within transdisciplinary digital biotechnology.

The project has produced two reports (“AS IS” and “TO BE”) about the Norwegian research innovation system and is now running several pilots to explore and experiment with the findings in these reports. Read more about the project and various pilots here.

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Staffing, the Board, Councils, and Committees

Management

- Morten Dæhlen
- Ingrid Glad (until 1.9.2023, Deputy for the Centre Leader, part time)
- Arne Bang Huseby (from 1.9.2023, Deputy for the Centre Leader)

Administration and Communication

- Eva Michelsen Ekroll (Head of Office from 1.12.23)
- Cecilie Linea Ellefsen
- Christoffer Hals (from 28.9.2023)

Data Science Analytics Group

- Gard Thomassen (Assistant Director USIT, until 30.4.2023, 20%)
- Arash Ahmadi (Team Manager from fall 2023)
- Svenja Christiansen
- Sherin Sugathan

Research and Projects

- DSTrain – Professor Arne Bang Huseby
- FME Proposal – Leif Næss (Senior Adviser, 1.9.2023-31.12.2023, 60%)
- Keith Lewis (40%)

Partner Program

- David Cameron (full time position from 1.11.2023)
- Laura Slaughter (from 15.1.2023)
- Nilla Karlsen-Davies (from 1.11.2023)

NORA

- Klas Pettersen (CEO)
- Sachin Gaur
- Synne Gjønnes (until 30.11.2023)
- Birte Hansen
- Anam Javaid
- Alex Moltzau
- Michael Solvang
- Kushtrim Visoka

Digital Life Norway

- Andy Boyce (from 1.10.2023)
- Christoffer Hals (until 27.9.2023)
- Henrik Lund (from 1.8.2023)
- Randi Taxt (until 31.12.2023)

Other

- Dzhema Melkonyan (29.8.2021–28.02.2023), Researcher through the international university network “Scholars at Risk”.

dScience Board

- Solveig Kristensen, Chairman (The Faculty of Mathematics and Natural Science)
- Morten Dalsmo (SINTEF Digital)
- Astrid Fossum Gulbransen (DNB)
- Stephan Oepen (Department of Informatics)
- Geir Dahl (Department of Mathematics)
- Susanne Viefers (Department of Physics)
- Cecilie Rolstad Denby (Department of Technology Systems)

dScience Council

- Fred Espen Benth (Department of Mathematics)
- Arnoldo Frigessi (Faculty of Medicine)
- Arne Bang Huseby (Department of Mathematics)
- Bjørn Høyland (Faculty of Social Sciences)
- Einar Broch Johnsen (Department of Informatics)
- Are Raklev (Department of Physics)
- Geir Kjetil Sandve (Department of Informatics)
- Anne H. Schistad Solberg (Department of Informatics)
- Jan Tore Lønning (Department of Informatics – until fall 2023)
- Trude Storelvmo (Department of Geosciences)
- Geir Olve Storvik (Department of Mathematics)
- Erik Velldal (Department of Informatics)
- Ingrid Kristine Glad (Department of Mathematics)
- Morten Dæhlen (dScience)

dScience Community Forum

- Marianne Zeyringer, Leader 2023 (Department of Technology Systems)
- Hans Arnold Winther (Institute of Theoretical Astrophysics)
- Ann-Cecilie Larsen (Department of Physics)
- Simen Kvaal (Department of Chemistry)
- Norbert Pirk (Department of Geosciences)
- Jonas Paulsen (Department of Biosciences)
- Ida Robertsen (Department of Pharmacy)
- Egor Kostylev (Department of Informatics)
- Kjetil Lysne Voje (Natural History Museum)
- Louise Emilsson (Faculty of Medicine)
- Diana Saplacan (Department of Informatics)
- Salvador Ortiz-Latorre (Department of Mathematics)
- Mikael Mortensen (Department of Mathematics)
- Johan Pensar (Department of Mathematics)

We would also like to thank the Faculty Administration for services within finance, HR and research, as well as the Science Library for their assistance at our monthly seminars.

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