Machine Learning & Artificial Intelligence

Future Science Platforms (FSPs) are an investment in science that underpins innovation and that has the potential to help reinvent and create new industries for Australia. FSPs will see us grow the capability of new generation of researchers and allow Australia to attract the best students and experts to work with us on future science.

MARS Conference 2023

> Where would you drive Machine Learning and Artificial Intelligence (MLAI) for the next decade?

Many of the challenges facing our society require multidisciplinary solutions which are larger than a single human brain can solve. Machine learning provides the opportunity to solve science challenges using data-driven or model-driven science, increased data interpretation speeds, or increased speed of data analysis. Digital technologies will be one of the key drivers of new industries in coming decades, and to be ready for this change we need to have new approaches to understanding increasingly complex, large and interlinked data sets, and to ensure that these approaches are interpretable, scalable, ethical and trustable.

Machine learning and artificial intelligence (ML/AI) are capabilities that will transform economies and the basis of competition globally, unlock new societal and environmental value and accelerate scientific discovery.

The MLAI FSP worked across the whole of CSIRO on cross-disciplinary projects that apply ML/AI to solve fundamental problems about conceptual and data-driven research applications. The solutions, platforms and people trained through the MLAI FSP, created a

new ongoing capability within CSIRO to address core research challenges for the benefit of Australia.

The MLAI FSP explored questions such as: how do we use machine learning to augment a scientist's ability to generate and learn from scientific data? What is the best way to include domain constraints (such as physical laws) and design constraints (such as privacy and fairness) into machine learning models? Where can we exploit genomic information in plant and animal breeding? Why is deep learning so effective in extracting meaningful features? How can we provide explainable AI for decision-making to protect the great barrier reef? Solving these types of challenges open new vistas of scientific knowledge and positive impact.

The goals of the FSP were:

- **Science –** an investment that will deliver lasting impact to areas of strategic interest across CSIRO by exploiting and advancing ML/AI research.
- **Technology –** to deliver new ML/AI solutions to age-old problems, novel solutions, and platforms for emerging challenges in a data driven world.
- **People –** the platform we create, and the people we train become a capability that fundamentally changes the way CSIRO undertakes core research challenges.

The MLAI FSP was designed to bring machine learning to CSIRO's science. It accommodated areas of expertise defined through a consultative process, and was structured into "activities", areas which could transform the science undertaken by CSIRO. The FSP was designed to consolidate the applications of ML into science across organisational boundaries.

02:25

CSIRO MARS 2023 highlights

Show text description

@CSIROMLAI

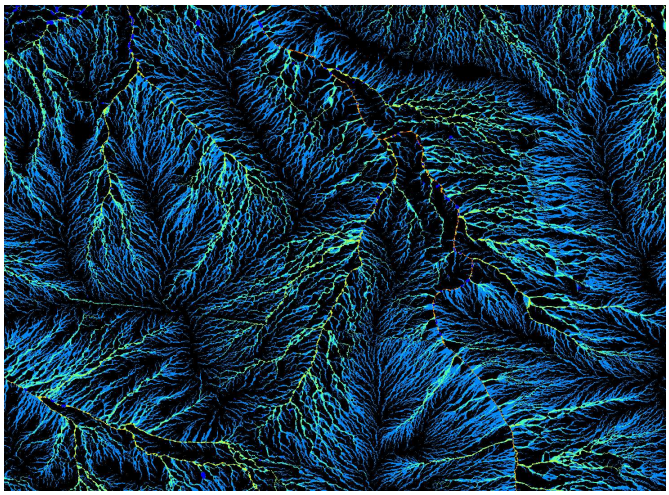
The Machine Learning and Artificial Intelligence Future Science Platform at CSIRO on Twitter.

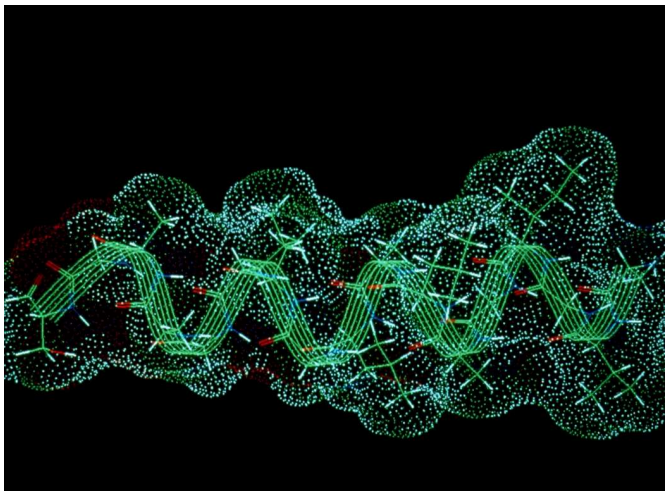
@CSIROMLAI

Open positions

Open positions (in partnership with major Australian universities). Please contact us for queries about research partnerships.

Current vacancies

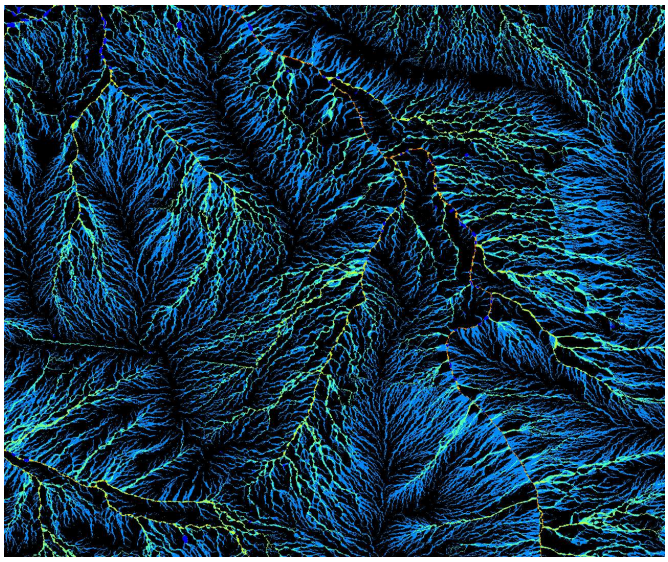




Conferences

MARS 2023

We are pleased to have bought you MARS 2023 which took place from 5-7 June 2023.

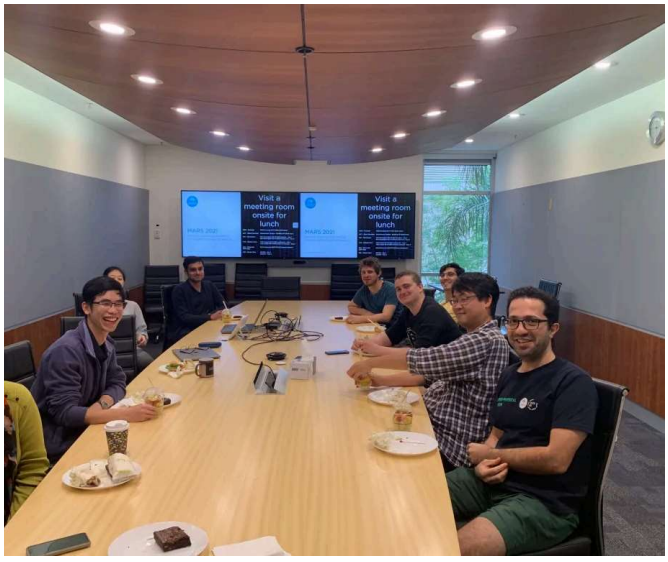


MARS 2023 Registration Terms and Conditions

The following terms and conditions apply to your registration to attend, and your attendance at the event, MARS 2023. We [...]

MARS 2022

We are very excited to have bought you MARS 2022 which took place on 31st May - 1st June 2022.

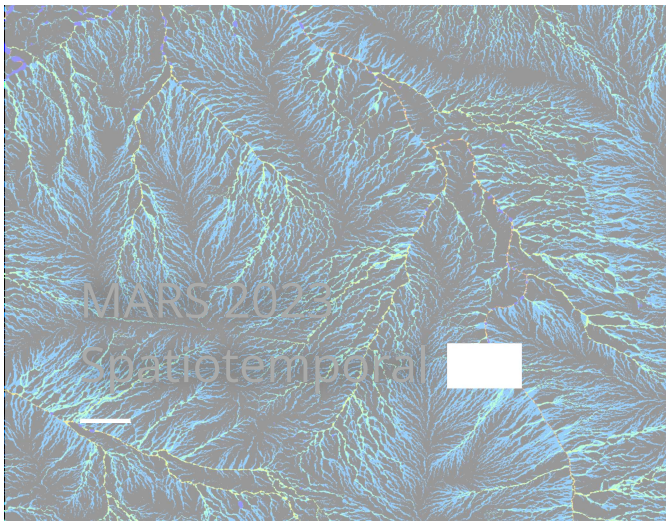


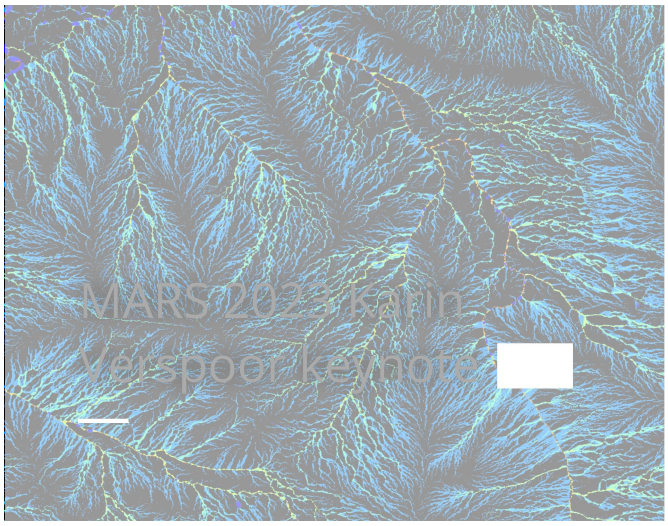
MARS 2021 – Virtual eConference Recordings/Program

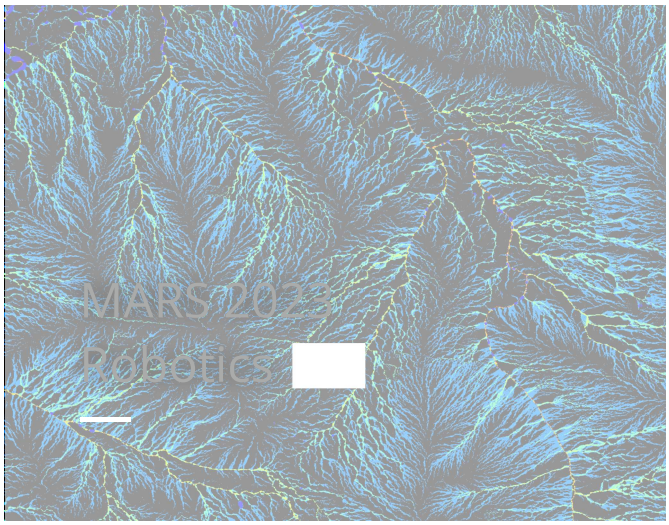
Recordings and Program from CSIRO's Machine Learning and Artificial Intelligence Future Science Platform Conference, MARS (Machine

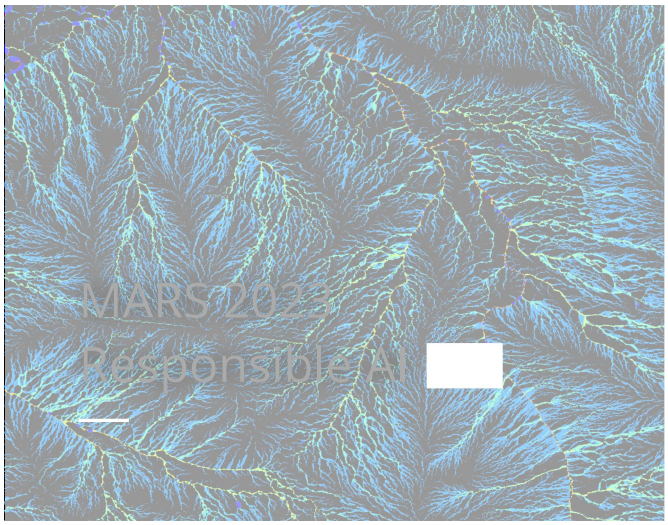
Learning and Artificial Intelligence Reimagining Science) 2021 on 1-2nd June 2021.

Recent video

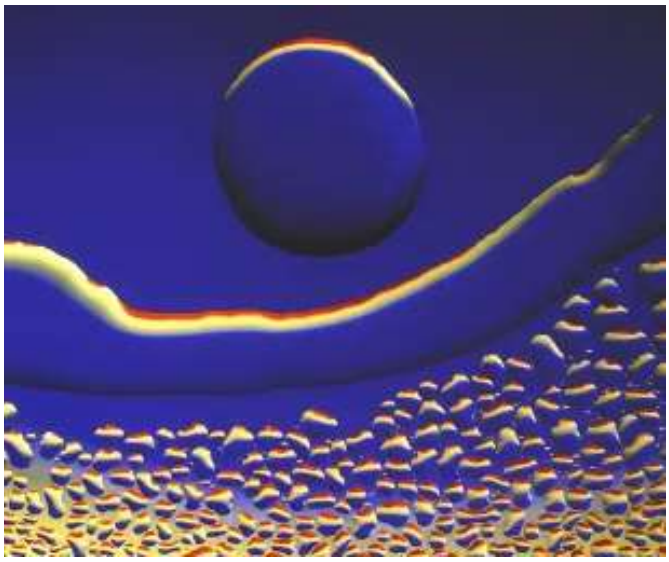








News



An Adaptive Solver for Systems of Linear Equations

Computational implementations for solving systems of linear equations often rely on a one-size-fits-all approach based on LU decomposition of dense matrices stored in column-major format.

New github repository

Hybrid has created a github repository where all our tech will be housed. Watch this space for further developments and feel free to start a discussion with us on anything hybrid!

CSIRO acknowledges the Traditional Owners of the land, sea and waters, of the area that we live and work on across Australia. We acknowledge their continuing connection to their culture and pay our respects to their Elders past and present. View our vision towards reconciliation.