

ENLIGHTEN YOUR RESEARCH 4

The winners of the 4th edition of the Enlighten Your Research competition were announced on the 7th of November 2013. For this edition researchers from any discipline and with any level of technical expertise were invited to submit a proposal with challenging data questions. The research should revolve around data which is either too voluminous or too varied to deal with using existing solutions.

Prizes

Participants competed for access to data storage, computing facilities, and visualisation infrastructure provided by SURFsara, for advanced network connections provided by SURFnet, and for support in the mapping of research solutions onto these e-infrastructure services by the Netherlands eScience Center (NLeSC).

The winners also received a cash prize of EUR 20,000.

THE BIG DATA CHALLENGE



THE WINNERS

MORE INFORMATION ON
ENLIGHTEN YOUR RESEARCH:
WWW.SURF.NL/EYR

Organising partners:

The organising partners of Enlighten Your Research 4 offer a world-class operational communication and computing infrastructure to facilitate scientific research. This e-Infrastructure provides researchers with high-speed communication networks and powerful computing middleware tools that foster collaboration and promote the shared use of high-end computing and data resources.



ENLIGHTEN YOUR RESEARCH 4



THE CONTEST

Lightpath for Optical Coherence Tomography imaging

Jury quote:

'This project will have a huge impact on the way medical and clinical researchers collaborate. The requested infrastructure provides new possibilities of sharing data and decision making.'

Main applicant:

MSc Mitra Almasian, PhD student,
Academic Medical Centre,
Biomedical Engineering & Physics

Partner institutes:

Technical University Delft (TU Delft)

About the project:

The 'Holy Grail' of medical diagnostics is an imaging technique that allows screening, diagnosis and monitoring of the progress of disease without damaging tissue or harming the patient. Optical Coherence Tomography (OCT) is a non-invasive, high-resolution 3D-imaging technique, providing microscopic 'optical biopsy' and is already being used on a regular basis in some clinical disciplines. OCT imagery can be integrated with other medical imaging technologies such as CT, ultrasound and MRI combining the benefits of each method. Due to the large volumes of data associated with the high resolution of OCT, this analysis requires high performance computing solutions.

This project aims to setup offsite storage and computing resources in a trusted environment where OCT datasets can be stored and analysed. From here the data can both be used for research applications, further accelerating collaboration and development as well as supporting the clinical decision making process by providing fast and accurate analysis.

Resources:

- Compute and storage resources on the HPC cloud
- Lightpath between the AMC and SURFsara
- Support with data integration and application optimization



Main applicant:

Stephen Helms, Postdoctoral Researcher,
FOM Institute AMOLF

Partner institutes:

Vrije Universiteit, Okinawa Institute of
Science and Technology (Japan)

About the project:

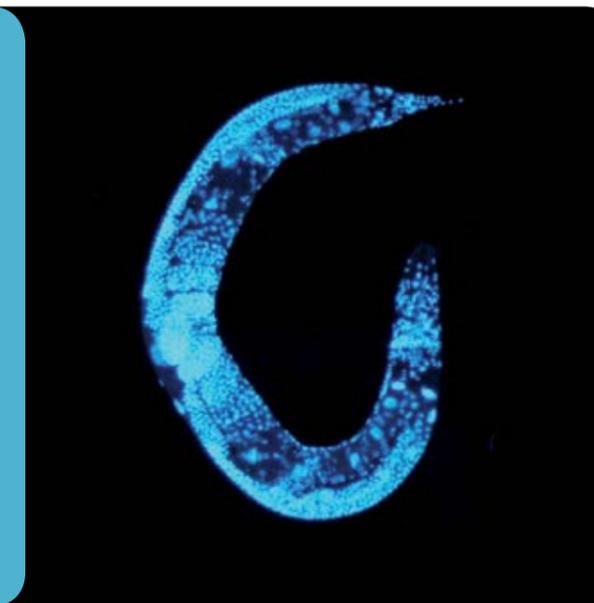
When studying the strategies animals use to navigate the world around them, model systems with roundworms such as the popular genetic model organism *C. elegans* are used.

To understand how *C. elegans* works, the study records large quantities of high-quality video data on the motility of worms. These are then processed using the tools from statistical physics to build simple models that accurately describe the behaviour. By comparing models across many individuals and species, it is possible to discover what aspects of the behaviour are important and how organisms adapt to different conditions.

The statistical approach requires a study of hundreds of individuals for each experiment. The accumulated terabytes of video data must be stored, processed, analysed, and shared among the various members of the research team spread across the world.

Resources:

- Compute and storage resources on the HPC cloud
- Lightpath connectivity to AMOLF, VU, SURFsara, OIST (Japan)
- Support on using the requested resources efficiently and help with porting applications to the HPC cloud



Using big data solutions to understand worm behavior

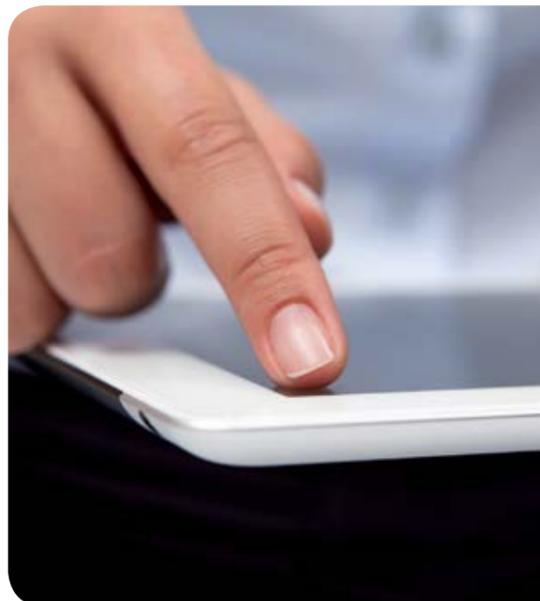
Jury quote:

'Scaling up the data analysis using the SURF infrastructure will be a fundamental step forward for the research on worm behaviour.'

Recording history through daily news streams

Jury quote:

'This proposal pushes the boundaries of the available infrastructure using an innovative way of analysing big data streams. A new way of dealing with the news.'



Main applicant:

Prof. Dr. Piek Vossen, Professor,
VU University Amsterdam, Faculty of Arts

Partner institutes:

Fondazione Bruno Kessler (FBK), University
of the Basque Country (EHU)

About the project:

Every day thousands of news articles are published, presenting new events or providing updates to events reported earlier. With current technology it is impossible to keep track of the vast amount of information coming in daily.

The purpose of this project is to develop the optimal architecture capable of processing as many daily news items as fast as possible, utilising the most advanced semantic processing techniques available in Natural Language Processing (NLP) today. One of the main challenges in this project lies in scaling up existing linguistic processing to maximise the usage of available computational resources in order to manage the daily stream of incoming information.

The resulting infrastructure will provide the basis to build a 'history recorder' that follows the news, stores it and can automatically relate new events to events that took place in the past. It will provide the complete story line to decision makers, pointing out forgotten details and possibly even finding new links between current situations and historic events.

Resources:

- Compute and storage resources on the HPC Cloud, Hadoop, Cartesius and LISA
- Support on application optimisation and service integration