

digital futures

NEWSLETTER MARCH 2021

In this issue

[Digital Futures Summer Research Internships Programme](#)
[People at Digital Futures](#)
[Digital Futures Research Programme Is Taking Shape](#)
[Open Calls](#)
[Digital Futures events October 2021](#)
[Upcoming lectures and seminars](#)

Latest news



Photo: Robert Eklund for Unsplash

Digital Futures Summer Research Internships Programme

- Digital Futures is running the **Summer Research Internships Programme** for the first time, but our division has had summer interns for several years now and our previous experience shows that it can be very rewarding for everyone, says **Henrik Sandberg**, Vice-chair Digital Futures Working Group Trust and Professor, Decision and Control Systems, at KTH EECS.

Students will get the opportunity to work closely together with PhD students, postdocs, and faculty on timely research problems, as well as participating in seminars related to PhD studies. We realized that many very talented bachelor and master students do not know what PhD studies really mean and where they lead.

This is an opportunity for them to get the first-hand experience of what they may entail. Several of our past interns have indeed later pursued PhD studies. Finally, for interns coming from abroad, June-August is also a great time exploring the city of Stockholm, concludes Henrik Sandberg.

Interested? Please get in touch if you would like to sign up interns or have any questions regarding the program or aforementioned activities.

[Contact details and more information about the Summer Programme](#)



Viktoria Fodor

People at Digital Futures

We talked to **Viktoria Fodor**, Professor at the Division of Network and Systems Engineering, KTH Royal Institute of Technology.

Viktoria is the PI of the Collaborative research project Decision-making in Critical Societal Infrastructures - **DEMOCRITUS** - at Digital Futures.

[Link to the profile of Viktoria Fodor](#)

Viktoria Fodor shares insight on DEMOCRITUS and explains why diversity can lead to a significant impact

What are the challenges behind this project?

- Our society utilizes large and complex infrastructures that are critical for our everyday life. These are for example built infrastructures, like road and railroad systems, water distribution networks, electrical grids, as well as wired and wireless communication networks. The maintenance of many of these infrastructures is still based on manual inspection, which means that emerging problems are not always noticed or are not noticed on time.

DEMOCRITUS is one of the collaborative research projects at Digital Futures. What is the purpose of this project?

- In the project **DEMOCRITUS**, we work towards the digitization of the maintenance, that is, monitoring, decision-making and control of large infrastructures. Our hypothesis is that there are common engineering principles that can be followed, even if these infrastructures have very diverse characteristics. Decision-making theory based on machine learning over networks could be a good name for this emerging research area.

There are several challenges to be addressed. The physical systems to be monitored are complex, which means that it is challenging to build mathematical models that give a detailed enough, but still tractable description of the system. At the same time, it is not straightforward either how to extend data-driven, machine learning-based solutions to these scenarios, as they are characterized by large, distributed datasets. Moreover, we face significant resource limitations. Most often, the communication resources are strongly limited, but sometimes, like in the case of water distribution networks, the measurements themselves are costly as well. We also need to consider the safety and security requirements, which are very strict in the case of societal systems.

How is the workgroup organized and who participates?

- To address all the challenges, the project has participants representing different theoretic areas and engineering approaches, from KTHs School Electrical Engineering and Computer Science and School of Engineering Sciences, from Stockholm University and from RISE. We collected experts in the areas of machine learning, networking, control, and security, some with a focus on theoretic research based on optimization, control theory, and stochastic modelling, some with expertise in experimental research.

Mention some interesting findings/conclusions? Anything that surprised you?

- It is astonishing how differently we see what the research challenges are in this quite well-defined area. The project participants are electrical engineers, computer scientists and mathematicians, but with rather distinct areas of expertise. We have very different views on what the most important scientific challenges are, and how these should be addressed. We see that this diversity can lead to significant impact because in the state of the art we do not see solutions that combine all these areas in a coherent, comprehensive way.

What is the next step? What would you like to see happen now?

- In addition to the first theoretic results, we are defining a common experimentation platform in the project, where all the contributions can be integrated in a flexible way. The framework will integrate simulators or emulators of the physical infrastructures, communication networks, and decision-making modules. Such a platform can make the evaluation of the new ideas easier and faster, so that we have more time for theoretic work, and at the same time it gives a good tool to demonstrate our results for various stakeholder groups. At the same time, we are still recruiting PhD students for the project. As PI, am looking forward to the time when all the students are here and we can form a research group that they all feel to be part of.

[Read more about DEMOCRITUS project here](#)

Strategic research programme



Digital Futures Research Programme Is Taking Shape

Since its inauguration last year, Digital Futures has had several calls for proposals and more than twenty cross-disciplinary projects with international research teams are now up and running. The illustration above shows which intersections of the Digital Futures research matrix each project primarily addresses.

Nine pilot research projects have evolved into **Collaborative projects** that will run for four years, involving nearly 50 established research leaders and their respective research teams. There are also six **Research pairs** breaking new ground in areas ranging from improving the diagnosis and treatment of anxiety disorders to designing threat models for cyber insurance. In addition, nine **Postdocs projects** are currently part of the Digital Futures' mobility program for talented early-career researchers, with two supervisors each from the Digital Futures faculty.

[Full article on Digital Futures website](#)

[More about the Strategic Research Programme](#)

Open Calls



Digital Futures Strategic Research Matrix



C3.ai Digital Transformation Institute

Open call: Second Call for Research Pairs Projects in Technologies for Digital Transformation

Digital Futures wants to facilitate collaboration between young researchers at KTH, Stockholm University or RISE.

Call closes: 31 March, 2021

[Read more & Apply](#)

Open call: Digital Transformation and AI for Energy and Climate Security

The Call is open to researchers at KTH Royal Institute of Technology and researchers at Digital Futures with partner Stockholm University.

Call closes: 29 March, 2021

[Read more & Apply](#)

Digital Futures events October 2021



Further career networking opportunities

Future Digileaders is a yearly event for selected early career researchers interested in the broad area of digitalization who identify as women or are non-binary. The event consists of a career workshop with talks, panels, and sincere discussions.

Future Digileaders '21 is a part of Digitalize in Stockholm 2021.

19 October 2021, 1 pm – 6 pm CET
[Read more](#)



Painting the digital future – a vision of 2040!

Digitalize in Stockholm is an annual conference and meeting place for global thought leaders and rising stars in academia, industry, government, and civil society – all engaged in transformation through digitalization.

SAVE THE DATE!
20 October 2021, 10 am – 5 pm CET
21 October 2021, 10 am – 2 pm CET

[Read more](#)

Upcoming lectures and seminars



DIVE-DEEP LUNCH SEMINAR

Pedro Ferreira, Associate Professor at the IT University in Copenhagen with a PhD from KTH talks about **Vulnerable Communities and Local Knowledge**.

[Read more](#)



FLY-HIGH FIKA SEMINAR

Elina Eriksson, Associate Professor in Human-Computer Interaction at EECS, KTH talks about **Digital Behavior Change Interventions to Catalyze More Sustainable Practices**.

[Read more](#)



DISTINGUISHED LECTURE

Rob Kitchin, Professor at Maynooth University Social Sciences Institute and Department of Geography provides a **critical reflection on the ideas and ideals of the smart city**.

[Read more](#)



FLY-HIGH FIKA SEMINAR

Professor **Jens Lagergren**, KTH Royal Institute of Technology talks about **Machine Learning for Somatic Evolution of Cancer**.

[Read more](#)

About us

Digital Futures is a cross-disciplinary research center that explores and develops digital technologies. We bring solutions to great societal challenges, in Sweden and globally. We generate knowledge, innovations and future leaders of high industrial relevance and strategic importance. Digital Futures is jointly established by KTH Royal Institute of Technology, Stockholm University and RISE Research Institutes of Sweden.

www.digitalfutures.kth.se

FOLLOW US ON SOCIAL MEDIA [in](#) [tw](#)

[To unsubscribe from future newsletters, click here](#)