MSCA Project Participation

Svitlana Surodina, Skein Group,
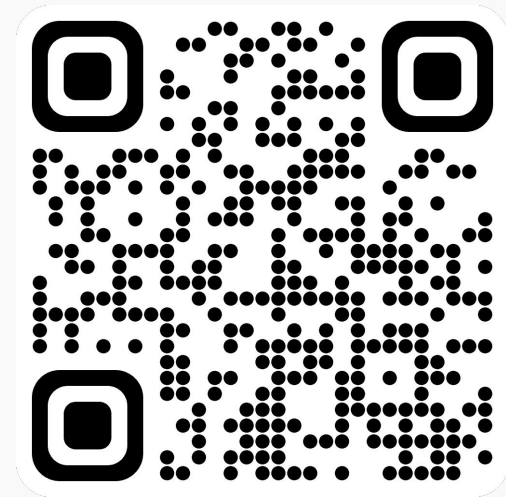June 2024

About Svitlana Surodina

- Over 20 years in digital innovation, software, AI

- Founder and Managing Director at Skein Group: Digital Technology Innovation Lab

- Skein works with academic and industry partners on research & innovation, creating products, and delivering them to market.

- Ukraine and UK offices, international partners and clients.

- Untypically for tech, Skein team is majority female.

DISCOVER NEW HORIZONS

Skein is a digital technology innovation lab. We develop and bring to market breakthrough solutions for healthier people and the planet.

INNOVATION

CONTACT US

Our MSCA Projects

mUltiscale IoT equipPed lonG linear infRastructure resilience built and sustAinable DevelopmEnt

HORIZON EUROPE

Fact Sheet

Objective

Long linear infrastructure (LLIs) earthworks (e.g. road & railway slopes, pipeline bedding, flood protection structures) are more vulnerable to cascading and escalating failures, due to their topographically designed spanning length and long operational lives. With increasingly frequent severe weather conditions caused by climate change, maintaining a high level of safety performance, especially for the aged LLIs, remains a constant challenge, leading to an ever-increasing amount of investment in maintenance. Current knowledge about how these assets deteriorate over time and how deterioration affects risk and performance is patchy. The conventional engineering-oriented approach alone became insufficient to provide a solution to the complex problem like this. As we accelerate into the 21st century, the latest advances in technology, through digitalisation by integrating new revolutionary data technologies of Internet-of-Things (IoT) and artificial intelligence (AI), offer opportunities to UPGRADE our LLIs and achieve new heights in safety and performance. Highly-skilled researchers and practitioners, capable of dealing with such problems, are scarce and in high demand by both academia and industry. Therefore, formed with 11 world-leading research organisations and 6 companies across Europe, Asia and Oceania with expertise and facilities in Earth Observation, geomaterial testing, constitutive modelling, data mining, machine learning, uncertainty quantification, data-driven design and optic communication, UPGRADE aims to ensure comprehensive, robust and implementable solutions are obtained for LLIs resilience built and sustainable development. The network is carefully designed to enable research and innovation staff exchange across all aspects. UPGRADE secondees will enjoy a highly integrated,

Project Information

UPGRADE
Grant agreement ID: 101131146

DOI
10.3030/101131146

EC signature date
20 October 2023

Start date
1 March 2024

End date
29 February 2028

Funded under
Marie Skłodowska-Curie Actions (MSCA)

Total cost
€ 0,00

EU contribution
€ 892 400,00

Artifical intelligence for high-capacity communication networks

The demands of high-speed, reliable and secure emerging internet, data centre, cloud computing, 5G and beyond systems have increased during the COVID-19 pandemic and require solutions for telecommunication networks with increased information capacity, intelligence and security. Artificial intelligence (AI) technologies have emerged as a promising solution for optical/wireless/hybrid networks. The EU-funded DIOR project will exploit a variety of the machine learning methods for efficient signal processing and resource allocation in optical/wireless/hybrid networks. The project will reduce signal distortions, predict network conditions and maximise network capacity. DIOR aims to integrate optical/radio network research and AI technologies and perform world-leading research on building a machine learning-underpinned communication platform to increase secure, intelligent and high-capacity communication networks.

Show the project objective

DOI
10.3030/101008280

Start date
1 December 2021

End date
30 November 2025

Funded under
EXCELLENT SCIENCE - Marie Skłodowska-Curie Actions
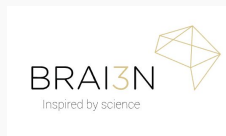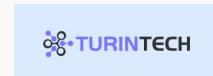
Total cost
€ 1 932 000

EU contribution
€ 1 633 000

Coordinated by
TAMPEREEN KORKEAKOULUSAATIO SR

SKEIN

MSCA Projects: partner collaboration

DIOR: UK Partners

DIOR — Deep Intelligent Optic and Radio

WARWICK — THE UNIVERSITY OF WARWICK
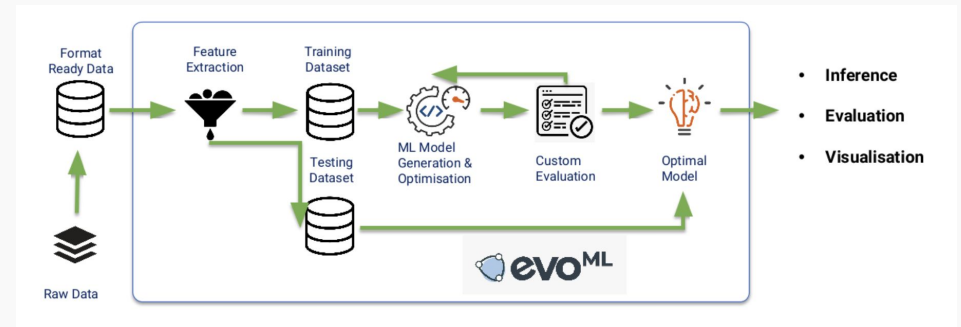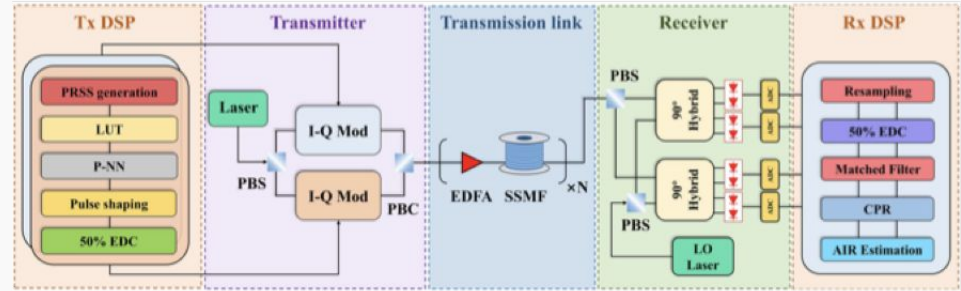
Intelligent signal processing, system modelling, and machine learning in communication systems.

10 Journal publications, 3 invited conference and 4 contributed conference publications under the DIOR project until now.

AutoML platform (EvoML) for signal analysis and prediction in wireless communication.

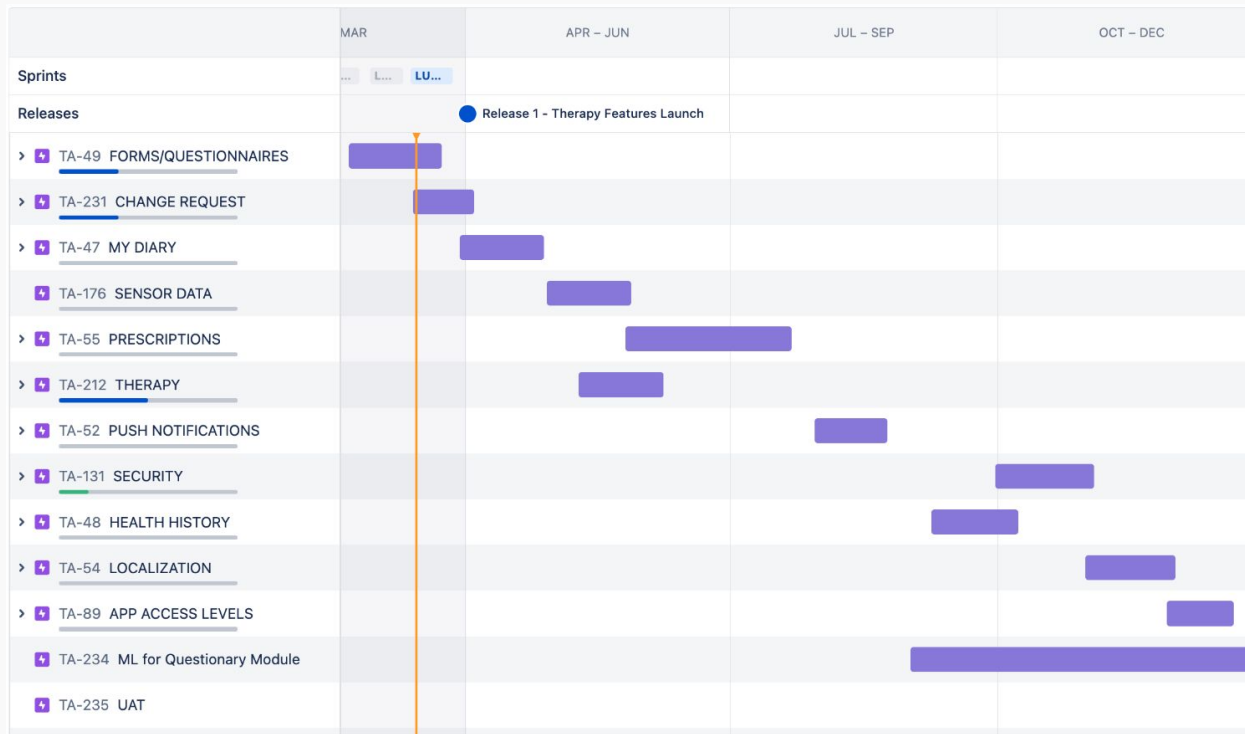TURINTECH

MSCA Projects: innovation networks

24:15
DIOR-AI: Machine Learning for Wireless Communications
48 views · 1 year ago

20:42
DIOR-AI: Equalization Enhanced Phase Noise
17 views · 1 year ago

34:05
DIOR-AI: Exploring Machine Learning in Telecommunications
48 views · 1 year ago

17:40
DIOR: European Union Innovation
40 views · 1 year ago

17:01
DIOR: Informed Machine Learning
11 views · 1 year ago

19:25
Introduction to DIOR
32 views · 1 year ago

40:14
Charting the Course for 6G
14 views · 1 year ago

22:47
DIOR-AI. Converging Machine Learning and Signal Processing on a Single Platform. Dr...
45 views · 1 year ago

Supporting our long-term innovation roadmap

	MAR	APR – JUN	JUL – SEP	OCT – DEC
Sprints	... L... LU...			
Releases	● Release 1 - Therapy Features Launch			
› TA-49 FORMS/QUESTIONNAIRES				
› TA-231 CHANGE REQUEST				
› TA-47 MY DIARY				
TA-176 SENSOR DATA				
› TA-55 PRESCRIPTIONS				
› TA-212 THERAPY				
› TA-52 PUSH NOTIFICATIONS				
› TA-131 SECURITY				
› TA-48 HEALTH HISTORY				
› TA-54 LOCALIZATION				
› TA-89 APP ACCESS LEVELS				
TA-234 ML for Questionary Module				
TA-235 UAT				

Funded by the European Union

NHS Digital

Ongoing projects:

2020- 2027 AJAX Decision support
2019-2025 Knowledge informed neural networks EU Grant: DIOR project

2022-2025 EU Grant: Migraine Resource constrained settings

2024-2027 UPGRADE AI innovation

2024 - OPORA platform

Development of team's strategic skills and cross-disciplinary expertise
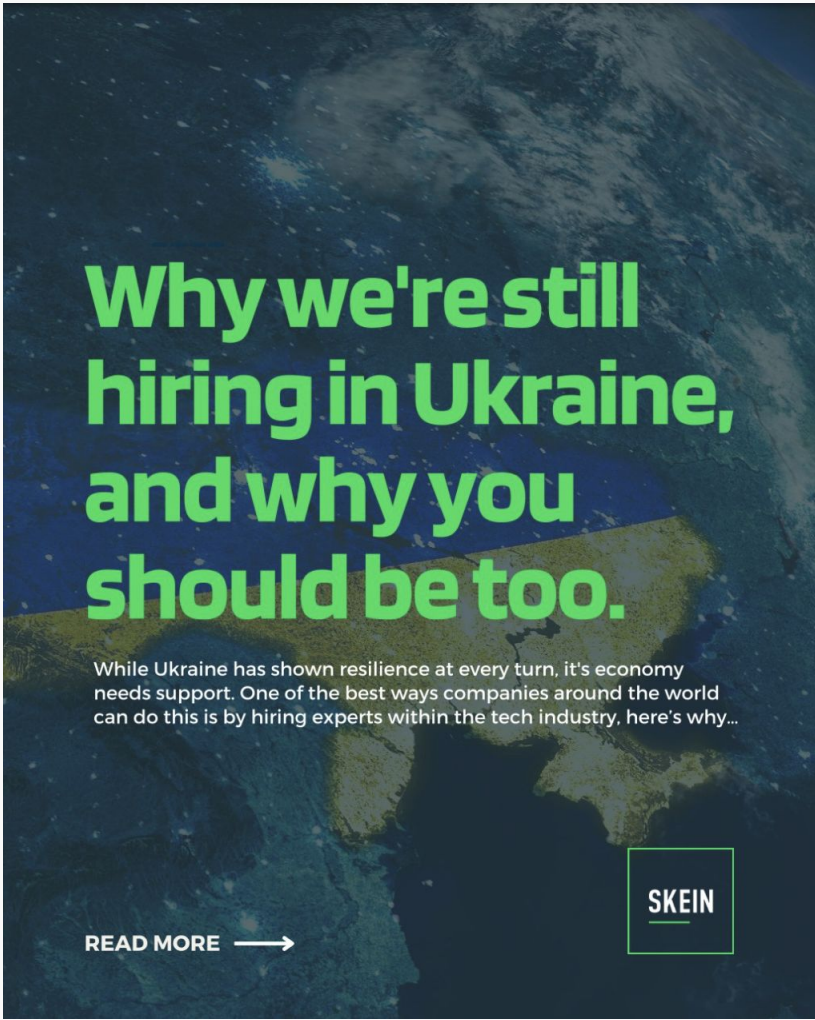
- AI for telecommunication: applications include high-fidelity holographic sensing and presence that covers all five senses, remote surgery, and comprehensive monitoring of health.

- Sharing our expertise with academic partners.

- Maintaining rigour and focus for fundamental research, co-authorship of academic papers.

- New opportunities to collaborate.

DIOR

Deep Intelligent Optic and Radio

UPGRADE
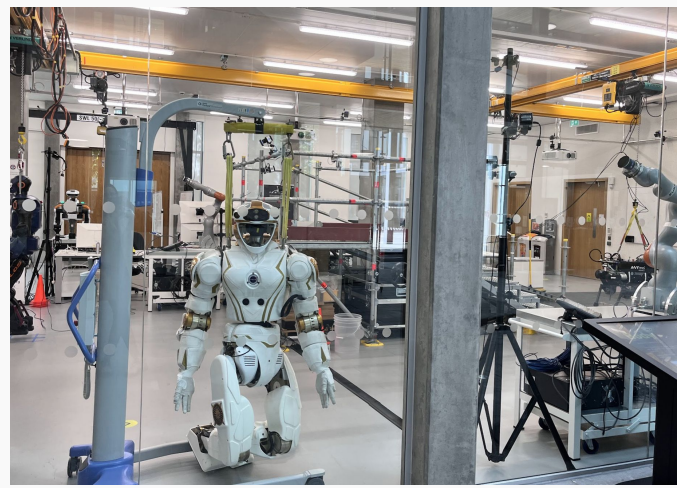
Supporting team growth & hiring

Why we're still hiring in Ukraine, and why you should be too.

While Ukraine has shown resilience at every turn, it's economy needs support. One of the best ways companies around the world can do this is by hiring experts within the tech industry, here's why...

SKEIN

READ MORE

Featured in the UK industry publications

June 2023

From 'Black Box' to Trusted Healthcare Tools
Physiology's role in unlocking the potential of AI for health

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of the population on which they are intended to be used. Data have often been collected on population cohorts that have gaps relating to disadvantaged or marginalised communities, which historically have lower rates of screening programme uptake.

…that research much of physiology in that conversation. "
Academic researcher

⊘ CASE STUDY

Diverse physiological data contribute to creating better, fairer AI for clinical decision support
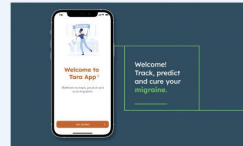
Skein developed an integrated platform that collects data from patient-focused mobile app, wearable devices and subcutaneous sensors to inform AI-driven decision support for diagnostics and prognostics of neurological conditions. It is currently being tested for migraine and is planned to be piloted for people with Parkinson's.

Incorporating heterogeneous data into the AI models, enabled more accurate and reliable predictions for the complex neurological conditions to be achieved. Moreover, by validating the quality and representativeness of the data it was possible to provide better explainability of the AI algorithms, helping distinct groups of clinical decision-makers to receive trustworthy predictions and ensure compliance with AI ethics regulations adjusted to their preferences, working patterns and goals.

While the system is still at the validation stage, it has indicated the potential to significantly cut costs and reduce pressure on the healthcare system by allowing at-home monitoring and care, reduce the time and effort by clinicians and better serve the under-represented groups of patients.

This project is part-funded by the European Commission (grant agreement 101057524)

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Egor Kotov
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AI for fairer clinical decisions
How diverse data can improve diagnostics for Parkinson's Disease

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Managing Director at Skein, and Ageing Research at King's Consortium, King's College London, UK

Chris Albertyn
Ageing Research at King's Consortium, and Department of Old Age Psychiatry at King's College London, UK

Richard Siow
School of Cardiovascular and Metabolic Medicine & Sciences, British Heart Foundation Centre of Research Excellence, Faculty of Life Sciences & Medicine

Director of Ageing Research at King's Consortium, King's College London, UK

Ira Haraldsen
Oslo University Hospital, Norway, and Coordinator, AI-Mind

https://doi.org/10.36866/pn.132.25

Artificial intelligence (AI) has the potential to transform early diagnosis and subsequent treatment of neurological conditions, such as Parkinson's disease. Early diagnosis means quicker access to vital care and support that could improve an individual's quality of life and disease progression. But the applications of AI do not stop there – AI is also helping researchers to better understand the causes of Parkinson's by assessing the changes in the brain at the initial stages of the disease. These early insights could be the key to developing new and better treatments.

At Skein, we are working on an AI tool to assist clinicians with the decision-making for Parkinson's. This can be informed by patient data, but unfortunately many datasets are not representative of the population. Improving the quality and diversity of the data will provide the greatest insights for the medical community, allowing for a broader identification of a range of factors, patterns or correlations, which would ultimately improve the accuracy and reliability of diagnosis and prognosis.

AI-based tools for early-stage diagnosis and timely interventions

To enable fairer, more ethical and comprehensive AI, Skein develops a platform that helps evaluate quality, representativeness and value of data for clinical decision-making using distributed collaborative learning approaches. The goals of ensuring validity, security and compliance of patient data collection are becoming especially relevant for innovative organisations who use AI to solve the biggest challenges in preventive healthcare. Among such initiatives is AI-Mind, a European project that aims to reduce the burden of ageing brain

conditions by developing novel, AI-based tools to support healthcare professionals in their early-stage diagnosis of people with mild cognitive impairment and offering timely interventions to patients.

Diverse physiological data ensure that clinical decisions are more personalised, thus providing tailored medical advice that is more likely to be effective. More importantly, by ensuring that AI tools are trained on a diverse dataset, it addresses the potential biases that may arise when considering factors like age, gender, race, and socio-economic background. This not only guarantees more equitable healthcare solutions but also ensures that historically marginalised and underserved groups receive medical attention that truly resonates with their unique physiological needs.

Parkinson's disease, a progressive neurodegenerative disorder

Parkinsons is the fastest growing neurological condition in the world, with approximately 10,000,000 individuals living with it (WHO, 2023; Parkinson's Foundation). The condition affects the nervous system, especially the
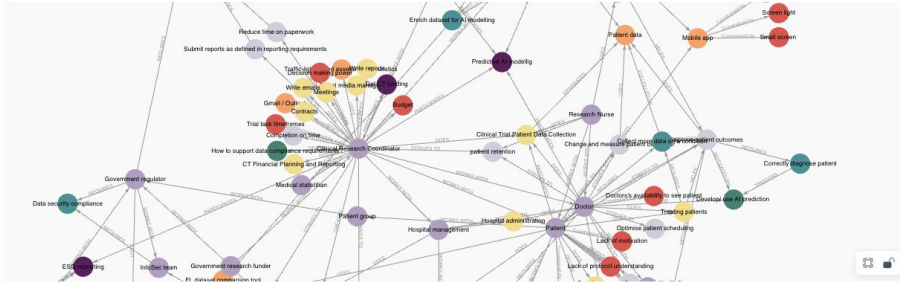
25

UK Research collaborations

Thank you

SKEIN

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