First Workshop on Intelligent User Plane and In-Network Computing for 6G,

IUP-INC-6G 2024, (in conjunction with CNSM 2024),

Monday 28 October 2024, Prague, Czech Republic

http://www.cnsm-conf.org/2024/IUP_INC_6G.html

Scope

In-Network Computing (INC) is a currently emerging concept, that has constantly been gaining relevance in the past couple of years, among others due to the ongoing advancements in programmable networking hardware (e.g. smart NICs) and the development of network programming languages, such as P4. Deploying INC in 6G Mobile Networks would mean that the User Plane is significantly enhanced in terms of its capabilities: Instead of just forwarding the data packets of a flow, 6G Access Nodes (ANs) and User Plane Functions (UPFs) can simultaneously compute on the packet's contents. This convergence of communication and compute capabilities can be referred to as the concept of an Intelligent User Plane. INC enables running different functions within network nodes, such as in-network analytics (e.g., data aggregation, packet inspection, machine learning inference pipeline), in-network caching (e.g., information-centric based), in-network security (e.g., firewalling, attack detection), thus providing secure and distributed intelligence, with benefits in terms of access delay, load balancing, and bandwidth consumption. Several research associations (e.g., one6G), renowned companies (e.g., Intel), and standardization development organizations such as the IETF/IRTF hype INC as one of the potential key enabling technologies for future networks, including 6G.

INC has an incredibly wide range of application areas, including robotics, video streaming, industrial IoT, Machine Learning, and many more. It can support novel 6G use-cases by its potential to optimize various network KPIs, such as the end-to-end latency, network traffic volume, or the UE energy efficiency. We encourage the submission of practical papers that may present measurements and performance studies relating to IUP/INC, as well as conceptual papers focusing on novel architectures and protocols for realizing INC (including control plane und user plane enhancements). The workshop shall attract authors and attendees from academia and industry likewise and provide them a common stage for discussing future directions on the topic.

Topics of Interest

Topics of Interest to the workshop include but are not limited to:

- Applications and Use-Cases in the INC Domain

- Stakeholders analysis and profiling
- User interaction and user design aspects
- Pilot evaluations of proof-of-concept implementations

- Design, Planning and Operational Issues of IUP/INC

- Platform and protocol considerations

- Capacity/resource planning and allocation
- Monitoring and optimization techniques

- In-Network Computing as an Enabler for Native AI in 6G

- ML inference in the User Plane
- NET4AI
- Distributed AI/ML training
- ML as a service

- Novel Architectures Supporting In-Network Computing

- RAN architectures enabling INC in 6G
- Holistic architectural concepts
- Enhancements and enablers in the Control Plane
- Enhancements and enablers in the User Plane
- Information centric networking-inspired approaches

- In-Network Computing for 6G-Relevant Sectors and Topics

- (Industrial) IoT
- Robotics
- Extended reality and Metaverse
- Security
- Health-care
- Entertainment and gaming
- Industrial/Time sensitive control

- Methodologies and Approaches Towards Evaluating the Performance of INC

- Analytical studies
- Simulation-driven evaluations
- Testbed-based experiments

Important Dates

Submission Deadline: August 23, 2024
Acceptance Notification: September 9, 2024
Camera Ready: September 16, 2024
Workshop Day: October 28, 2024

Paper Submission Guideline

Authors are invited to submit original unpublished papers not under review elsewhere. Papers should be submitted in IEEE 2-column format (Style templates can be found https://www.ieee.org/conferences/publishing/templates.html). Maximum paper lengths, including title, abstract, all figures, tables, and references, are 7 pages for regular papers and 4 pages for short papers. Regular paper length could include up to 7 pages including references. Short papers are accepted as well and must not exceed 4 pages including references.

Papers have to be submitted electronically in PDF format through the EDAS conference management system, accessible via this link https://edas.info/newPaper.php?c=32713.

All submitted papers will be peer-reviewed and selected based on their originality, significance, technical soundness, and relevance to the workshop's theme. For accepted papers, at least one author is expected to register and present the paper in person at the workshop. Accepted and presented papers will be published in the conference proceedings and submitted to IEEE Xplore.

Workshop Chairs

Riccardo Trivisonno, Huawei Technologies, Germany
Thomas Zinner, NTNU, Norway

TPC Co-chairs

George Karetsos, University of Thessaly, Greece
Antonella Molinaro, University Mediterranea of Reggio Calabria, Italy, and University Paris-Saclay, France
Susanna Schwarzmann, Huawei Technologies, Germany

Publicity Co-chairs

Aryan Kaushik, University of Sussex, UK

Keynote and Panel Chair

Stanislav Lange, NTNU, Norway