IDLab UGent – Research Engineer in Device-to-Device (D2D) Communications

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Ghent University – imec IDLab Research group

DLab is an imec research group embedded at Ghent University and the University of Antwerp, focusing on internet technologies, wireless communication systems, and data science. It brings together more than 300 researchers and data scientists from over 40 nationalities, combining expertise in connectivity, distributed systems, and artificial intelligence.

At Ghent University, IDLab conducts research across the domains of internet technology and connectivity on the one hand, and data science and artificial intelligence on the other. Its activities span the full innovation stack, ranging from fundamental models and algorithms to system design and real-world applications, addressing challenges in areas such as telecommunications, smart environments, industry, mobility, and healthcare.

IDLab is part of imec, a world-leading research and innovation hub in nanoelectronics and digital technologies. Imec enables end-to-end innovation by combining expertise in hardware, software, and system design, supporting the development of next-generation communication and intelligent systems.

The group benefits from a unique and extensive experimental research infrastructure, including wireless testbeds, IoT and robotics laboratories, and large-scale validation environments, allowing researchers to validate new concepts under realistic conditions and transition from software prototypes to real-world systems.

ABOUT THE POSITION

Future applications such as smart environments, industrial systems, and large-scale wireless deployments increasingly rely on advanced wireless technologies (5G/6G, and Wi-Fi) for real-time communication, sensing, and control. Ensuring reliable and efficient operation in dynamic environments requires new approaches to decentralized and adaptive communication.

This research focuses on Device-to-Device (D2D) communication and decentralized wireless networking, enabling systems that can operate efficiently with reduced reliance on centralized infrastructure. A strong emphasis is placed on experimental validation using real wireless platforms, as well as the evolution from software-defined implementations towards hardware-efficient realizations.

JOB DESCRIPTION

The successful candidate will work on the design, development, and experimental validation of advanced D2D communication mechanisms.

Your main responsibilities include:

· Design and implementation of D2D communication protocols, including 5G NR sidelink and decentralized networking approaches

· Development and extension of open platforms such as srsRAN and OpenAirInterface (OAI)

· Implementation of PHY/MAC layer functionalities for direct communication, synchronization, and resource

management

· Development of multi-RAT communication strategies, combining 5G and Wi-Fi technologies

· Prototyping and validation on Software Defined Radio (SDR) platforms

· Experimental evaluation in realistic and dynamic wireless environments

· Integration and deployment of AI/ML models (e.g., foundation models and agentic AI) on end devices, focusing on efficient execution under real-time constraints, interaction with the communication stack and system-level optimization

· Collaboration with system and hardware experts to evolve SDR-based solutions toward embedded and hardware-efficient implementations (e.g., FPGA/SoC)

· Contribution to system-level design decisions, including partitioning functionalities between software (CPU) and hardware acceleration

This is a **hands-on engineering and research position**, where the focus is on building and validating real wireless systems.

YOUR PROFILE

We are looking for a candidate with strong technical expertise and a passion for building real-world wireless systems.

Required qualifications

- Master's degree or PhD in Electrical Engineering, Computer Science, Telecommunications, or a related field
- Strong background in wireless communications and networking
- Hands-on experience with srsRAN, OpenAirInterface (OAI), or similar platforms
- Good understanding of Device-to-Device (D2D) communication and 3GPP systems
- Experience with Software Defined Radio (SDR) platforms (e.g., USRP)
- Strong programming skills in C/C++, Python, and Linux environments
- Knowledge of PHY/MAC layers and signal processing fundamentals
- You are a team player and have strong communication skills.
- You can commit to timing and milestones set forward by different research projects.
- Your English is fluent (C1 CEFR level) both speaking and writing.

Key requirement (system-level awareness)

- Understanding of how SDR-based implementations translate to embedded or hardware platforms, including awareness that not all protocol stack layers should or can be implemented on FPGA/SoC, ability to reason about functional partitioning between software and hardware acceleration, and ability to collaborate effectively with hardware (FPGA/SoC) experts
- Understanding of how communication and AI components interact at system level, particularly the deployment of AI models within real-time communication systems

Preferred profile

- Experience in wireless system development and integration
- Familiarity with multi-RAT systems (5G, Wi-Fi, mesh networks)
- Basic understanding of AI/ML deployment and inference on resource-constrained systems
- Experience or interest in integrating pre-trained models into real-time systems
- Awareness of latency, memory, and power constraints in embedded execution

INTERESTED?

· **Start date: as soon as possible**

- We offer a full-time position as a researcher position, consisting of an initial period of 12 months, which will be extended after a positive evaluation.
- Payroll: imec vzw
- Place of employment: UGent, Technologiepark-Zwijnaarde 126, 9052 Gent

MORE INFORMATION

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