

IDLab UGent – PhD Specialized Time-Sensitive Wireless Connectivity

PhD Position in Specialized Time-Sensitive Wireless Connectivity for Demanding Markets

Job description

ABOUT GHENT UNIVERSITY

Ghent University is a world of its own. Employing more than 15.000 people, it is actively involved in education and research, management and administration, as well as technical and social service provision on a daily basis. It is one of the largest, most exciting employers in the area and offers great career opportunities.

With its 11 faculties and more than 85 departments offering state-of-the-art study programmes grounded in research in a wide range of academic fields, Ghent University is a logical choice for its staff and students.

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For the (faculty/department/research group) we are looking for a m/f/x

Doctoral fellow in the field of Specialized Time-Sensitive Wireless Connectivity for Demanding Markets.

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YOUR JOB

Within the faculty of Engineering and Architecture, the IDLab research group (<https://idlab.ugent.be/home>) performs research on internet technologies and data science. In these areas, we focus on foundations, system design, and applications. IDLab collaborates with many universities and research centers worldwide and jointly develops advanced technologies with industry. IDLab has a unique research infrastructure used in numerous national and international collaborations. IDLab is also a core research group of imec, the world-leading research and innovation hub in nanoelectronics and digital technologies. IDLab staff counts about 50 professors, 60 post-doc researchers, 200 PhD researchers and 40 other staff members. These are spread over about 20 research teams.

The research will be conducted within the Intelligent Wireless Networking (iWiNe) team (<https://idlab.ugent.be/research-teams/iwine>), internationally recognized for its work on openwifi and wireless Time-Sensitive Networking (TSN) (see <https://github.com/open-sdr/openwifi> and .

Future digital infrastructures are increasingly relying on wireless connectivity for applications that require stringent timing guarantees, including industrial automation, robotics, professional audio and video production, autonomous systems, and critical cyber-physical infrastructures. While wireless technologies have become ubiquitous, they still struggle to provide the deterministic behavior, synchronization accuracy, reliability, and predictability required by these demanding markets.

In the FWO SBO project 6GSPECNet, we aim to further develop the foundations of future wireless communication systems capable of delivering application-specific connectivity guarantees. The project will investigate how future 6G networks can evolve beyond best-effort communication towards specialized connectivity services offering well-defined latency, reliability, synchronization, and availability characteristics. A key enabler for this research is openwifi, IDLab's open-source full-stack Wi-Fi implementation that runs on system-on-chip FPGA platforms (<https://github.com/open-sdr/openwifi>). Openwifi provides full access to the wireless protocol stack and hardware implementation, making it a unique research platform for exploring and validating future wireless communication

concepts.

Building on ongoing developments in openwifi and already available Time-Sensitive Networking (TSN) extensions, this PhD will investigate novel mechanisms that bring deterministic communication capabilities to wireless networks, thereby spanning the entire protocol stack (from digital baseband to application level) and end-to-end wired-wireless system. The candidate will contribute both to the scientific foundations and to the practical realization of these technologies through implementation on the openwifi platform and validation in advanced wireless experimentation facilities.

You will:

- Conduct high quality research under the supervision of Prof. Jeroen Hoebeke and Prof. Ingrid Moerman with the aim of obtaining a doctoral degree.
- Study state-of-the-art technologies in deterministic wireless networking, next-generation Wi-Fi, Time-Sensitive Networking (TSN) and demanding application domains (e.g. industrial automation, robotics, etc.).
- Design novel mechanisms that provide predictable latency, reliability, synchronization accuracy, and service continuity. These mechanisms can range from digital baseband (PHY) and low-level MAC functionalities on FPGA platforms (e.g. RFSoc) to higher-layer networking enablers running in a Linux environment.
- Design resource allocation, scheduling, synchronization, and traffic management mechanisms for mission-critical wireless systems that span the full end-to-end wireless-wired TSN system.
- Implement and validate proof-of-concept solutions using advanced testbeds, real-world demonstrators, and experimental platforms.
- Closely collaborate with other researchers at IDLab.
- Publish research results in leading international conferences and journals.
- Collaborate with industrial stakeholders representing demanding application sectors.
- Assist in limited educational tasks of the research group

Job profile

- You have a master's degree in Computer Science, Telecommunications, Electrical Engineering, or a closely related field, or you will have obtained it by the time you start.
- You have a strong interest in the design and operation of wireless communication networks and are interested to do research in this area within an academic environment for a 4 years period in view of a PhD degree.
- You can demonstrate excellent study results (as a minimum requirement distinction and preferably great distinction).
- When interest in the lower-layer aspects of wireless deterministic systems, you have multiple of the following skills:
 - o Knowledge on digital communications and signal processing
 - o Experience with FPGA design (VHDL/Verilog/SystemVerilog)
 - o Experience in wireless PHY implementation (e.g., OFDM, synchronization, channel estimation)
 - o Understanding of MAC layer design and real-time system constraints
 - o Familiarity with digital ASIC design and/or SDR platforms(e.g., Zynq SoC, RFSoc,)
 - o Knowledge of fixed-point design and hardware constraints
 - o Strong programming skills (C/C++, Linux environments)
- When interested in the higher-layer aspects of wireless deterministic systems, you have multiple of the

following skills:

- o Knowledge on (wireless) communication systems and stacks (in particular Wi-Fi), networking protocols and network management.
- o Experience in writing software and prototyping with strong programming skills (C/C++, Linux environments, GitHub/GitLab, AI coding, etc.)
- o Experience in protocol stack or network algorithm design
- o Knowledge on Time-Sensitive Networking, real-time systems/operating systems, industrial communication, cyber-physical systems....
- o Knowledge on the experimental validation of end-to-end systems
- You are well-organized and able to autonomously plan and execute tasks.
- You have strong analytical skills to interpret the obtained research results.
- You are a team player and have strong communication skills.
- Your English is fluent, both speaking and writing.

WHAT WE CAN OFFER YOU

- We offer a full-time position as a doctoral fellow, consisting of an initial period of 12 months, which - after a positive evaluation, will be extended to a total maximum of 48 months.
- Your contract will start on October 1st, 2026 at the earliest.
- The fellowship amount is 100% of the net salary of an AAP member in equal family circumstances. The individual fellowship amount is determined by Team Personnel Administration based on family status and seniority. A grant that meets the conditions and criteria of the regulations for doctoral fellowships is considered free of personal income tax. [Click here for more information about our salary scales](#)
- All Ghent University staff members enjoy a number of benefits, such as a wide range of training and education opportunities, 36 days of holiday leave (on an annual basis for a full-time job) supplemented by annual fixed bridge days, bicycle allowance and eco vouchers. [Click here for a complete overview of all the staff benefits.](#)

How to apply

Please apply via this link before the end of November 2026:

<https://en/ph-d-specialized-time-sensitive-wireless-connectivity>

We do not accept late applications.

For more information about this vacancy, please contact Prof. Jeroen Hoebeke (jeroen.hoebeke@UGent.be)

<https://idlab.ugent.be>