

Wireless communication and networking of novel Point-of-Care analytical devices

Summary

Thomas Johann Seebeck Department of Electronics at the School of Information Technologies, Tallinn University of Technology, Estonia, has an opening for a PhD project with the tentative title „Wireless communication and networking of novel Point-of-Care analytical devices“, as part of the PhD programme Information and Communication Technology.

Research field:	Information and communication technology
Supervisors:	Dr. Tamas Pardy Yannick Le Moullec
Availability:	This position is available.
Offered by:	School of Information Technologies Thomas Johann Seebeck Department of Electronics
Application deadline:	Applications are accepted between June 01, 2020 00:00 and July 03, 2020 23:59 (Europe/Zurich)

Description

CONTEXT

Typically, Point-of-Care (PoC) devices refer to medical diagnostics that execute a single chemical analysis for a single target at the point of care, that is, bedside in a hospital, at a local clinic, or at home, rather than at a centralized laboratory, which processes high quantities of incoming samples. Widely known examples are glucometers, many of which have recently been equipped with wireless communication, e.g. via BLE 4.0 or later. However, at present, this communication is limited to a PoC device to smartphone link. Novel experimental portable diagnostics are becoming far more advanced on the chemical assay level (e.g. multiplexed DNA testing), and therefore far more demanding with respect to technology than before. Thanks to advances in IoT, benchtop and handheld analysers can now be linked for communication to set up a complex analytical workflow in the field as well as achieve a yet unprecedented level of automation while remaining fully portable.

OBJECTIVES

The objectives of the PhD project include:

1. Researching state-of-the-art as well as cutting edge technology, in order to implement wireless communication in a novel modular, portable, Point-of-Care analytical setup developed as part of project PRG620.
2. Address scientific and technical issues, e.g. reliability, security, scalability and compatibility related to local networks of PoC devices, as well as connecting these networks to the Internet.

QUALIFICATIONS

- MSc in the field of electrical engineering, physics, or similar discipline
- Excellent communication and writing skills in English
- Prior knowledge of communicative electronics is preferable, possibly including e.g. IEEE wireless communication standard(s)
- Previous experience in at least one of the following: electronics design, embedded programming (C/C++), simulation and/or implementation of wireless communication technologies
- No previous experience with Point-of-Care devices expected, but is a bonus

Tallinn University of Technology is an equal opportunity university. Female applicants are particularly encouraged to apply.

CONTACTS

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- Co-supervisor Tamas Pardy, tamas.pardy@taltech.ee

REFERENCES

- Rodrigues, J. J., Segundo, D. B. D. R., Junqueira, H. A., Sabino, M. H., Prince, R. M., Al-Muhtadi, J., & De Albuquerque, V. H. C. (2018). Enabling Technologies for the Internet of Health Things. IEEE Access, 6, 13129-13141.
- Alam, Muhammad Mahtab; Malik, Hassan; Khan, Muhidul Islam; Pardy, Tamas; Kuusik, Alar; Le Moullec, Yannick (2018). A Survey on the Roles of Communication Technologies in IoT-Based Personalized Healthcare Applications. IEEE Access, 6, 36611–36631. 10.1109/ACCESS.2018.2853148



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