Global Acting in IT
The Internet of Things

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Winter Semester 2024/25

Overview

- International Minor Global Acting in IT 2024

The Internet of Things

Part 1

International Minor Global Acting in IT

- Invasive Species (2024 Overall Topic)

International Minor Global Acting in IT

UNIVERSITY
UPPER AUSTRIA

#FH OÖ #Campus Hagenberg
Freitag, 22.03.2024

Studium   International   Campus   Forschung   Weiterbildung   Die FH OÖ   Karriere

Vier Länder in 16 Wochen: Drei Hagenberg Studierende über ihr außergewöhnliches Auslandssemester

Für Jan Eberwein, Johannes Eder und Florian Rakos, alle drei Medientechnik- und -design Studierende am FH OÖ Campus Hagenberg, war das vergangene Wintersemester ein unvergessliches Abenteuer. Gemeinsam nahmen sie am „International Minor Global Acting in IT" teil – einem Partnerprogramm ihrer FH mit vier internationalen Hochschulen, das sie von Pretoria in Südafrika über Lleida in Spanien und Hasselt in Belgien bis nach Eindhoven in den Niederlanden führte und auch in Hagenberg selbst Station machte.

Abenteuer Südafrika: v.l. Florian, Jan und Johannes im Elefanten-Schutzgebiet in Pretoria. Bildquelle: Privat/FH OÖ

International Minor Global Acting in IT: Structure

Together with four international partner universities, Fontys ICT developed a minor programme of one semester (30 ECTS). The participating universities are located in: Spain, Austria, Belgium, South Africa and The Netherlands of course. The minor consists of six blocks in total, contributing to a central theme with a local specialism. You will travel the locations abroad and attend their block of three weeks locally.

Block 0 1 week	Block 1 3 weeks	Block 2 3 weeks	Block 3 3 weeks	Block 4 3 weeks	Block 5 3 weeks	Block 6 3 weeks
2 - 6 SEPT	9 - 26 SEPT	30 SEPT - 17 OCT	21 OCT - 7 NOV	11 - 28 NOV	2 - 19 DEC	6 - 16 JAN
Home (online)	Fontys ICT Eindhoven, Netherlands	Universidad de Lleida, Spain	FH Oberösterreich Linz, Austria	PXL Hasselt, Belgium	Belg. Campus Pretoria, South Africa	Home
Start Up	Future Tech	UX Design	IoT	Ai	Data Science	Round off

The aim of this minor is to combine international IT topics and trends in IT with intercultural aspects, and to actually experience this in an international setting. Companies attached to the universities will be participating in the blocks co-creating and defining the projects. The minor is only offered in the Fall semester. You can also choose to stay at home for a certain block and participate remotely.

"WILL YOU JOIN?"

To learn more about this minor and Q&A we are organising (online and live) info sessions with the minor coordinator and an experienced student. Sign up for a session through the website: STUDYNAVIGATORFONTYSICT.NL/MINORS

Students work together in international groups on an overarching semester project.

The three keystones of the programme are:
1. Intercultural awareness and practice
2. International collaboration and experience
3. Examining ICT from a global standpoint, with focus on having a positive impact on society, the environment and beyond.

The (learning) objectives of the minor are:
- Creating responsive ICT professionals: adaptive, resilient, innovative and responsible
- Global Citizenship & Intercultural Awareness
- Communication and collaboration across borders
- The student can study and work on real life projects abroad in an international environment

The areas of expertise in this minor are:
Block 0: Start up from home (online)
Block 1: Future Tech (The Netherlands)
Block 2: UX Design (Spain)
Block 3: IoT (Austria)
Block 4: AI (Belgium)
Block 5: Data Science (South Africa)
Block 6: Round off portfolio from home

MORE INFORMATION: STUDYNAVIGATORFONTYSICT.NL/MINORS
- Fontys ICT, application procedure ProgressWWW
- Travel and housing is at own cost, although Fontys will partly contribute with a Fontys ICT scholarship. Advise is to arrange for travel in time to keep costs limited. Housing at the locations.

For more information on the minor programme:
Maike Simon - de Vocht: m.devocht@fontys.nl

# International Minor Students 2024

Invasive Species (2024 Overall Topic)
Water Hyacinths are Native to South America

1 Relation to the Project of the Center for Biological Control (Rhodes University, ZA)

2 Style of Lecture: 21.10. − 8.11.2024

The Invasive Specie Water Hyacinth Occupies the Lake Victoria.
Water Hyacinths are Not Native to Africa

How can we support Prof. Julie Coetzee and the Center for Biological Control (Rhodes University, ZA) using IoT and LoRaWAN?
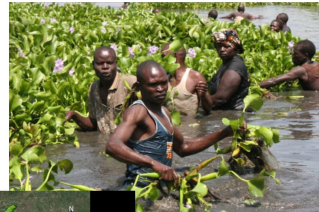
How can IoT and LoRaWAN support the Stakeholders' Research?
The Big Idea

Measuring Water Chemistry

- Place a couple of LoRaWAN-Gateways around the Victoria lake equipped with a
  - GPS-Receiver to get the exact location of it and
  - solar cells and accumulators to make the gateway autonomous, and
  integrate them into The Things Network.
- Development of a swimming LoRaWAN-Node equipped with a
  - GPS-Receiver to get the exact location of it and
  - solar cells and accumulators to make the node autonomous, and
  measuring
  - water quality
  - amount of nutrients in the water
  - . . . ,
  integrating it into The Things Network and sending the measured data and the GPS location to the gateway and therefore also to The Things Network.
- Development of a management and data acquiring Web interface.

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IoT in Hagenberg (21.10. – 8.11.2024): Style of Lecture

The vision of designing and building concrete LoRaWAN gateways, LoRaWAN nodes and web applications has a major implication on the lecture style:

- It will not be a classical lecture but more of a workshop.
- I will not lecture a lot, but sometimes i will.

I will
- be your coach during the lecture/workshop.
- advise on technologies in general.
- advise on hardware and software to let the idea come true, and here especially on
    - ESP-8266, ESP-32, sensors, actuators, bus systems, Raspberry Pi,
    - MQTT and the MQTTsuite and
    - SNode.C/express and Node.js/express for web development.
- . . .

You will
- do research about topics related, relevant and necessary for the project.
- design and build the hardware for the LoRaWAN nodes.
- develop the protocol used to transmit the measurements to The Things Network.
- implement the software for the nodes.
- design and implement the web application used to administrate the gateways and nodes.
- design and implement the frontend web application for data access and data analysis.
- . . .