Mobile Computing & Internet of Things

Introduction to the course

LTAT.06.009

Fall 2021
Jakob Mass

● PhD Student @ Mobile & Cloud Lab since 2016
● Working as Junior Lecturer
● Helping teach Mobile Development courses since 2014
● Interested in Android development, Service-Oriented IoT, BPM, Real-time Data integration, visualization for IoT
About us: ulno (you’ll know)

ULrich NOrbisrath (ulno.net)

Educator/Consultant/Mentor
Researcher/Inventor/Maker/Artist
YouTuber (youtube.ulno.net)
→ Geek

Globalist (Living, Teaching, Research)
    Estonia, USA, Germany, Austria, Kazakhstan, Singapore, Indonesia, Brazil

Research: VR/AR, Internet of Things, Software Craftsmanship,
Pedagogy/Andragogy, PhD: Home Automation (RWTH Aachen)
About us

Kelian Kaio

- Android Developer @ Mooncascade since 2016
- Master’s degree in Software Engineering
- Experience with creating different mobile applications
  - Parking, banking, music, children’s learning app, HOIA ...
Course Outline
Outline

● Android Development
  ○ UI & UX
  ○ Kotlin
  ○ State & Data management
  ○ Architectural patterns
  ○ External APIs and libraries (REST APIs, Google Maps, Firebase Storage, ... )

● Internet of Things
  ○ (Smartphone sensors)
  ○ Arduino
  ○ Practical IoT
    ■ Hardware - Sensors, Actuators
    ■ Communication Protocols
    ■ Integration & Management

● Team Projects
Who is this course for?

● Programming skills are necessary
  ○ Object Oriented Programming (OOP)
  ○ Previous Java experience will be handy

● Comfortable trying out different languages, frameworks
  ○ Kotlin, Dart, Arduino C++, Python...
  ○ NodeRED, PlatformIO

● Capable of finding additional learning material
  ○ Lectures, labs will provide some links and references to get you going
How will the course take place?

- **Weekly lectures**
  - Recorded, Streamed - Panopto and/or MS Teams

- **Weekly labs**
  - Work on your own laptops
  - IoT hardware provided by us (in Tartu)

- **Homeworks & Task-Based Portfolio**
  - Mostly bi-weekly, several team-based

- **Final Team project**

- **No Exam**
Grading

- Mobile part 40 pts
- IoT part 40 pts
- Team project 20 pts
- Bonus points - up to 10 pts

Need to score 70 pts to earn a “pass”

Other rewards might be announced for excellent contributions!
Grading - details

- **Mobile part - 40 pts**
  - 3 Bi-Weekly individual homeworls (1 person) - 8 pts each
  - 1 Larger homework (2 person teams) - 16 pts

- **IoT part - 40 pts**
  - Portfolio based
  - Personal written report (keywords style) of anything you do - successes AND failures
  - 2 bi-weekly checkpoints for feedback - 20 pts each
    - Teams of 2 or 4 - depending on available hardware

- **Team Project - 20 pts**
  - Last few weeks devoted to projects
  - Plan your own idea, pitch, implement and present it
  - Teams of 4
Grading Policy

● Submit homeworks by 23:59 on the given deadline
  ○ Submission based on git commits/tags
  ○ Ideally, finish before lab session

● Late submission penalties:
  ○ Up to 1 week late - your points are reduced by 50%
  ○ More than 1 week late - you get 0 pts for that task
Submission

● We will use CS institute’s GitLab
  ○ https://gitlab.cs.ut.ee
  ○ Log in with your UT account

● Every student creates their own repo
  ● Repo will be used for most of the tasks & personal documentation
  ● Report your task results in the Repo Wiki / README markup files
Note-taking exercises

- Lectures sometimes include mini-exercises, surveys etc
- Class exercise results should also be added to your personal repo
Communication & Online/Remote Learning

- Lectures and labs take place in Delta
- Sessions will be recorded and uploaded to Panopto
  - We aim to also provide livestreams for lectures
- We will use MS Teams for daily communication
  - Asking for help online related to labs, tasks, lectures etc
  - Organizing into teams
  - Quick announcements
  - Etc
Getting information

- **Course webpage**
  - [https://courses.cs.ut.ee/2021/MCIoT](https://courses.cs.ut.ee/2021/MCIoT)
  - Links to slide pdfs, videos, task descriptions

- **Search online**
  - To complete assignments, independent searching for material is assumed
  - [https://developer.android.com/](https://developer.android.com/) -- you will use this a lot during the first weeks of the course
Dealing with problems & getting help

- Ask lecturers / lab instructors
  - In person, on MS teams or via e-mail:
    - Jakob Mass - jakob.mass(at)ut.ee
    - Ulrich Norbisrath - ulno(at)ulno.net
    - Kelian Kaio - kelian.kiao(at)ut.ee

- Write & Check at MS teams
  - Maybe somebody already dealt with a similar issue. If not, write about the issue so others may help you!
Questions?

Is the organization of the course clear?
UINo’s IoT Introduction
Jakob’s Android Intro
This week

- 1st labs take place on Wednesday
- Bring your laptop!
- Download & Install Android Studio and Emulator before the lab!
- Follow the guide here:
  - [https://courses.cs.ut.ee/2021/MCIoT/fall/Main/SettingUpAndroidStudio](https://courses.cs.ut.ee/2021/MCIoT/fall/Main/SettingUpAndroidStudio)