MSc Theses Proposals by Paulo Ferreira


Learn by doing !

- Professor at UiO – office in room 10460
  - https://www.mn.uio.no/ifi/english/people/aca/paulofe/index.html

- MSc theses will be done at UiO / PSE
- Do you have your own suggestions? Let´s talk !

- More information:
  - come to room 10460 and we have a chat
  - send me an email: paulofe@ifi.uio.no

- Requirements:
  - good tracking record (grades, courses), enthusiasm, and commitment.

- MSc themes:
  - Java Virtual Machine
  - Ubiquitous/Mobile Systems
  - Distributed Systems

VfcShareLatex - Efficient Consistency for Cooperative Latex Edition

- **Background:**
  - Collaborative writing tools are widely used and available
    (e.g.Overleaf, ShareLatex - https://www.sharelatex.com/).
  - **A problem** is the speed at which "userA" sees the changes that "userB" has done
  - Thus, there are several consistency protocols that can be used for that purpose.
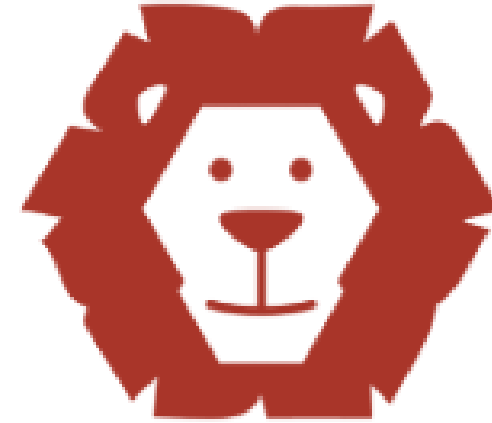
- **Goal:**
  - Design a module based on the consistency protocol called Vector Field Consistency (VFC)
    (https://link.springer.com/chapter/10.1007/978-3-540-76778-7_5).
  - VFC allows updates to different parts of a document to have different priorities (e.g., depending on the relative interest of the user in the region in which the update is performed).
  - Implement and improve the current version of VFC and integrate with ShareLatex.
  - Evaluate the protocol VFC in ShareLatex.

- **Requirements:**
  - Enjoy and have adequate skills to deal with Linux and JavaScript.

Termite – Supporting Encounter Based Apps

- **Background:**
  - Encounter based mobile applications (apps) are now possible.
  - **A problem** is the difficulty when developing such "encounter-based" apps (e.g., number of devices, paths, debug, etc.)
  - It is based on the used of several VMs in the cloud
  - Each VM emulates a smartphone, and each one moves according to an easy to specify path

- **Goal:**
  - Improve the current version of Termite (https://nuno-santos.github.io/termite/index.html#overview) by providing a set of GPS trajectories for the smartphones path

- **Requirements:**
  - Enjoy and have adequate skills to deal with Java and Android.

MagSign – Android Magnetic Signatures of Transport Modes

- **Background:**
  - Woorti (http://www.woorti.com/) is a smartphone app (Android and iOS) that detects the transport mode that is used (https://www.youtube.com/watch?time_continue=3&v=o2E1md1t69U)
  - It transparently monitors your transport modality using sensors
  - However, sometimes Woorti is not capable of making a correct detection of the transport mode
  - It is based on a ML classifier running in the smarphone

- **Goal:**
  - Develop a module for Android based on the magnetic signatures of different transport modes
  - Improve the detection accuracy of Woorti
  - Design, implement, and evaluate the solution developed

- **Requirements:**
  - Enjoy and have adequate skills to deal with Java, Android, and mobile system issues.

GCgraalVM – Garbage Collection for the Graal Virtual Machine

- **Background:**
  - Currently, the NG2C Garbage Collector uses the ROLP system (running in the OpenJDK JVM) to detect the age of created objects so that the NG2C allocates such objects close to each other
  - Such allocation contributes to improve GC latency while keeping a good throughput

- **Goal:**
  - Develop ROLP for the GraalVM (it is a innovative Virtual Machine that supports several languages - Java, JS, Ruby, etc.)
  - The development should be language agnostic

- **Requirements:**
  - The candidate must enjoy and have adequate skills to deal with systems' implementation
  - The candidate should be able to program in C++ and Java
  - Also relevant is a good tracking record (grades, classes done), enthusiasm, and commitment
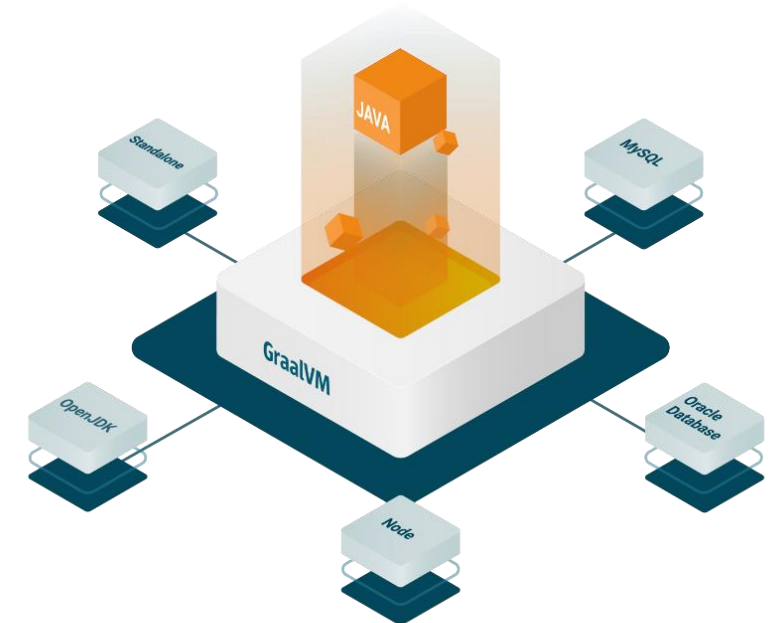
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- Questions?
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web page (these slides): https://www.mn.uio.no/ifi/english/people/aca/paulofe/index.html

course at UiO (IN5600): https://www.uio.no/studier/emner/matnat/ifi/IN5600/index-eng.html