Universität Stuttgart

INSTITUT FÜR
KOMMUNIKATIONSNETZE
UND RECHNERSYSTEME
Prof. Dr.-Ing. Andreas Kirstädter

Bachelor thesis No. 1041

Building a Julia App for Visualizing Multi-Domain Intent-Driven Operation

Methods
Software design
Simulation
Programming

Topics
Communication networks
Network control

Background

Intent-Based Networking (IBN) is increasingly used to improve network control and management. IBN is a modern paradigm that enables simplified coordination of a network with intents as basic building blocks. IBN decouples the implementation details from the network operator's desires or intentions, i.e., intents. The operator's intents can be abstractly defined, while the implementation is handled automatically from the system internals.

IKR develops a Framework for Intent-driven Multi-Domain Network coordination, https://github.com/UniStuttgart-IKR/MINDFul.jl. MINDFul.jl a young project aiming to research coordination algorithms of intent-driven multi-domain (MD) networks. It offers interfaces for the development of resource-allocation algorithms and MD coordination mechanisms. It includes a stateful representation of common networking equipment and facilitates event-based simulations and meta-analysis.

Problem Description

In this work, you are called to design and implement a Graphical User Interface (GUI) for MINDFul.jl using Makie.jl, a powerful visualization library. Your work should provide intuitive visualizations of the underlying problems and interaction possibilities. This thesis can be structured in the following steps:

- get familiar with Julia, Makie.jl and MINDFul.jl
- design the architecture for your platform
- implement the solution
- build tests to evaluate your work

Acquired Knowledge and Skills

With this work, you will get a great insight into IP-optical networking, and you will learn about IBN. Moreover, you will experiment with Julia, a highly performant scientific language. Lastly, you will use your creativity to develop a user interface for an advanced academic simulation tool.

Requirements
Programming Experience

Desirable knowledge
Kommunikationsnetze I

Contact

Dipl.-Ing. Filippos Christou
room 1.319 (ETI II), phone 685-67968, E-Mail filippos.christou@ikr.uni-stuttgart.de