

## **Development and implementation of an optical high-speed free-space link**

**Notice of vacancy:** Master's/Diploma thesis

**Field:** Optical data communications

**Beginning date:** a.s.a.p.

### **Description:**

In future networking scenarios it would be appealing to offer alternatives to existing, RF-based wireless transmission and network technologies. One candidate is free-space transmission via the direct modulation of LEDs. The topic of the current thesis will be the development of the physical layer of a high-speed short-range optical link, which will serve as the backbone for a future Fast-Ethernet link. Tasks to be performed include the design and building of a linear high-speed driving circuit for LED arrays and assessment of multi-level channel coding techniques for this particular transmission channel.

### **Work plan**

<b>Description</b>	<b>Time allotted</b>
Familiarisation with the topic	0.5 m
Design and build driving circuit	2 m
Test of driving circuit	0.5 m
Test of multi-level high-speed transmission	0.5 m
Feasibility study of high-speed optical links by the use of VDSL or WLAN chips	1.5 m
Write thesis	1 m

### **Mandatory prior knowledge:**

- Electronics (designing and building of circuits)
- (introduction to) communications

### **Beneficial prior knowledge:**

- building of high-speed driving circuits
- working knowledge of analog circuit design (e.g. Eagle, Spice)
- working knowledge of DSL and/or WLAN chips

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