FACULTY
OF INFORMATION
TECHNOLOGY
CTU IN PRAGUE

Assignment of bachelor's thesis

Title:	Open-source system for cloning of RFID/NFC cards and tags
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Study program:	Informatics
Branch / specialization:	Computer Security and Information technology
Department:	Department of Computer Systems
Validity:	until the end of summer semester 2024/2025

Instructions

Open-source system for cloning RFID/NFC cards and tags
Radio-Frequency Identification (RFID) and Near Field Communication (NFC) technologies have become essential for many industrial and commercial applications, including logistics, healthcare, industrial and security. Special cards/tags are usually required to use these technologies effectively. This bachelor thesis will focus on the development of an open-source device that can clone and emulate RFID/NFC cards/tags from different manufacturers.
Aims of the bachelor thesis:
1) Design an open-source device architecture for cloning RFID/NFC cards/tags (both software and hardware) with respect to modularity and future extensibility. The device must function as a standalone unit without the need to interface with a personal computer. Use a commercially available microcomputer such as Raspberry Pi, Arduino or similar to implement the device.
2) Develop software in C++ or Python programming language to clone and emulate RFID/NFC cards/tags of at least 3 different types such as Mifare Classis , Mifare Ultralight, Mifare Desfire v1 etc. Debug the software directly in the environment of the chosen microcomputer.
3) Implement a user interface to control the device that allows the user to easily interact with the device and use its features.
4) Test the finished device on different types of RFID/NFC cards/tags and evaluate its functionality.

Electronically approved by prof. Ing. Pavel Tvrdík, CSc. on 10 December 2023 in Prague.

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