Martin Farkas

Nationality: Hungarian | **Email address:** martin.farkas@edu.bme.hu | **Website:** https://home.mit.bme.hu/~farkas/ | **LinkedIn:** MartinFarkasCS | **GitHub:** BlackLight54 | **OrcId:** 0000-0003-4260-717X | **Google Scholar:** GWHwCIkAAAAJ | **ResearchGate:** Martin Farkas | **MTMT:** 10098507 | **WoS:** MBH-7169-2025

ABOUT ME

Skilled and dedicated Computer Science student specializing in System Engineering and development of fault-tolerant software utilising Modern Service Platforms, bringing forth expertise in design, integration, deployment, testing, and maintenance of systems and applications.
Proficient in technologies and methods for creating, testing, deploying, and maintaining privacy-preserving, fault-tolerant, decentralised, and blockchain-based systems. Deep understanding of computer science from logic gates up to high-level languages. Accustomed to working well with others and committed to meeting deadlines and adhering to project guidelines. Can tackle critical problems with a clear mind. Able to effectively self-manage during independent projects, as well as collaborate in a team setting. Skilled in public speaking and presentation.

WORK EXPERIENCE

BUDAPEST UNIVERSITY OF TECHNOLOGY AND ECONOMICS – BUDAPEST, HUNGARY

Department Critical Systems Research Group | Department of Artificial Intelligence and Systems Engineering |

Website https://ftsrg.mit.bme.hu/hu/

RESEARCH ASSISTANT – 2023 – CURRENT

Research into privacy-preserving technologies in blockchain contexts.
Development of groundbreaking Zero-Knowledge Proof systems.
Education and demonstration in the topic of Self-Sovereign Identites, Distributed Systems, and Blockchain technologies.
Mentoring of and consulting with BSc and MSc students.

QUANOPT KFT. – BUDAPEST, HUNGARY

SYSTEMS ENGINEER – 2023

Developed, tested, and deployed a Hyperledger Fabric-based consortial blockchain chaincode for managing usage data of public service infrastructure utilising fablo, java, and docker.
Developed, tested, and deployed a swagger-based RESTful API for the previous service using nodejs, express, mocha, chai, and typescript.
Carried out a performance measurement campaign for the forementioned system.

NAS KFT. – BUDAPEST, HUNGARY

CRYPTOCURRENCY MINING PLATFORM DEVELOPER – 2022

Prototyped a GPU-based cryptocurrency mining platform utilising Go Ethereum
Researched and reviewed candidate cryptocurrency mining software
Did market analysis and demonstrated the relevant design choices regarding a would-be cryptocurrency mining platform

EDUCATION AND TRAINING

2025 – CURRENT Budapest, Hungary
COMPUTER ENGINEERING, PH.D. Budapest University of Technology and Economics

Website https://www.bme.hu/ | **Field of study** Model driven design of decentralized trust solutions

Link https://doktori.hu/doktori-kepzes/temakiirasok/267330/

2023 – 2025 Budapest, Hungary
COMPUTER ENGINEERING, M.SC. Budapest University of Technology and Economics

Website https://www.bme.hu/ | **Field of study** IT Security, Critical Systems | **Final grade** Summa Cum Laude |

Thesis Self-Sovereign Identity based Self-Evaluated Policies

2019 – 2023 Budapest, Hungary
COMPUTER ENGINEERING, B.SC. Budapest University of Technology and Economics

In my thesis work, I proposed two payment schemes over the openCBDC transaction platform, utilising the Hyperledger Aries SSI framework
Developed Solidity based Smart-Contracts within an educational project focused on designing, deploying, and load testing an application that manages NFTs on the Ethereum Blockchain and Hyperledger Fabric
Created a load-testing framework for MIT MediaLab's openCBDC (Project Hamilton) in JMeter, in connection with in-house research on a domestic Central Bank Digital Currency
Developed multiple server-side applications, both with REST API-s and HTML, using frameworks from Express.js with NodeJS to Java Spring
Developed single and multi-agent artificial intelligence systems in Python and Jason/AgentSpeak
Developed games and client applications in C, C++, C#, Java, Android, and Flutter
Gained experience with DevOps tools like Git, Docker, Kubernetes, GitHub workflows, Jenkins, SonarQube, Gradle, Maven

Website https://www.bme.hu/ | **Field of study** System Engineering |

Thesis Self-Sovereign Identity supported payment on the openCBDC platform

2013 – 2019 Győr
HIGH SCHOOL DIPLOMA Révai Miklós Secondary Grammar School

Website http://www.revai.hu/hun/

PROJECTS

2024 – CURRENT
Development of CBDC systems in the Cooperation of the Hungarian National Bank (MNB) and the Budapest University of Technology (BME)

Integrating a novel Self-Sovereign Identity (SSI) based Zero-Knowledge Proof (ZKP) protocol into a Central Bank Digital Currency (CBDC) prototype within the Cooperation of the Hungarian National Bank and the Budaprest University of Technology based on my own research with the Critical Systems Research group at the Department of Artificial Intelligence and Systems Engineering of the Budapest University of Technology.

2023 – CURRENT
Blockchain task of DigitalTech EDIH at the Budapest University of Technology

Helped the development of coursework for the Blockchain task of DigitalTech EDIH, which is part of European Digital Innovation Hubs initiative of the European Commission. The topics I contributed to included permissioned blockchains and the groundbreaking developments in digital identity management, such as SSI.

2023 – CURRENT
Training SMEs for the Digital Decade (SME4DD)

Helped the development of coursework for the "Training SMEs for the Digital Decade" (SME4DD) EU project. The projects aim was to introduce SMEs to blockchain technology, with all the related fields, such as digital identity management, which was the topic I contributed to.

2023
Blockchain based data storage for smart gas-meters

Lead developer in a DLT-based meter data storage project for a Hungarian gas provider at QUANOPT Kft.

2025/03 – 2025/10
Self-Sovereign Identity authorization system using Hyperledger Fabric

2025
DC4EU: Digital Credentials for Europe | Pilot facilitation at BME

2025/09 – 2025/11
Elektronikus Munkaadat Szolgáltatási Platform(EMAP) | Nemzeti Adó és Vámhivatal | ET 3.1

CONFERENCES AND SEMINARS

2025/08/31 – 2025/09/05 Seville
23rd International Conference on Business Process Management | BPM'25

Title: A Self-Orchestration Model for Business Collaborations with Verifiable Process History Credentials

Link https://www.springerprofessional.de/en/a-self-orchestration-model-for-business-collaborations-with-veri/51385454

2024/08/21 – 2024/08/23 Krakow, Poland
MASCOTS 2024 | EuroCyberSec Workshop

Title: A Prolog-based Approach to Self-Evaluated, Declarative and Zero-Knowledge Verifiable Policies

Link https://mascots24.iitis.pl/

2025/04/23 – 2025/04/25 Budapest, BME VIK
37th National Student Research Conference | Information and Communication Technology Section | Cybersecurity category

Title: Self-evaluated policies using Zero-Knowledge Proofs
Award: 3rd place

Link https://otdk25.vik.bme.hu/tagozatok/12-kiberbiztonsag

2024/07/03 – 2024/07/05 Szeged, Hungary
CS² | The 14th Conference of PhD Students in Computer Science

Title: Design Space Exploration of Verifiable Credential Schemas using Partial Graph Modeling

Link https://www.inf.u-szeged.hu/~cscs/program.php

2023/11 Budapest
Budapest University of Technology Faculty of Electrical Engineering and Informatics Students' Scientific Conference '23

Title: Self-evaluated policies using Zero-Knowledge proofs
Placement: First place
Section: Information Systems

Link https://tdk.bme.hu/conference/VIK/2023/sessions/inform2/paper/Onkiertekelo-eljarasrendek-tamogatasa

2022/11 Budapest
Budapest University of Technology Faculty of Electrical Engineering and Informatics Students' Scientific Conference '22

Title: Payments in openCBDC with Self-Sovereign Identitites – from the verifiable to the private
Placement: Reward
Section: Information Systems

Link https://tdk.bme.hu/conference/VIK/2022/sessions/inform1/paper/Fizetesek-az-openCBDCben-onszuveren

2024/11 Budapest
Budapest University of Technology Faculty of Electrical Engineering and Informatics Students' Scientific Conference

Title: Design Space Exploration of Verifiable Credential Schemas using Partial Graph Modeling
Placement: Third place
Section: System Modelling

Link https://tdk.bme.hu/conference/VIK/2024/sessions/model/paper/Design-Space-Exploration-of-Verifiable

LANGUAGE SKILLS

Mother tongue(s): **HUNGARIAN**

Other language(s):

	UNDERSTANDING		SPEAKING		WRITING
	Listening	Reading	Spoken production	Spoken interaction	
ENGLISH	C1	C1	C1	C1	C1

Levels: A1 and A2: Basic user; B1 and B2: Independent user; C1 and C2: Proficient user

SKILLS

Languages

Rust | Solidity | Prolog | Circom | Elixir | C | C++ | JavaScript | Java | Kotlin | C# | Shell Script (Bash) | Python

Web Technologies

node.js | web3.js | next.js | nest.js | tailwindCSS | express.js | HTML

DevOps tools

Docker | Kubernetes | Git | Jenkins | Maven | GitHub Workflows | Gradle | SonarQube | Snyk | CI / CD pipeline design | Continous Integration and Continous Delivery

DLT (Blockchain) development

Geth | Truffle | Ganache | Hyperleder Indy | Hyperledger Fabric | Hyperledger Aries

Agent Programing

BDI arcitecture | AgentSpeak(L)

Database Management

SQL | MongoDB | Relational databases

Development Frameworks, Tools, Skills

Flutter | Design Patterns | Spring

API design and development

Swagger | REST | DIDComm

System Engineering

SysML | PlantUML | Latex | UML

Cryptography

Zero Knowledge Proofs | snark.js | Cryptographic protocols | Cryptographic algorithms

RESEARCH VISITS, SUMMER SCHOOLS, SEMINARS, ETC.

2025/08/06 – 2026/08/15

Summer School Marktoberdorf 2025 | MOD25

Since 1970 the Marktoberdorf Summer School has attracted the best researchers on cybersecurity in the world. The Marktoberdorf Summer School 2025 will focus on presenting the latest developments toward the specification and verification of secure cyberspaces. The summer school will feature 12 courses by top researchers in the area.

Link https://www.congresscenter.philosophie.uni-muenchen.de/kongresse/mod25/index.html

HUSTEF'24

HUSTEF ranks among the *top three* conferences in Europe for professionals in all areas of software testing and quality. Established in 2011, its aim was to create a yearly platform for the best of the software and IT R&D sector to share the latest industry developments.

Link https://hustef.com/

Hacktivity'25

The Longest-running IT Security Festival in Central & Eastern Europe.

Link https://hacktivity.com/

TUTORING

BME VIK TDK'25: Cloud-ready, compositionally verifiable zero-knowledge evaluation of declarative policies

BME VIK TDK'25: LLM-assisted creation and refinement of error propagation analysis models

BSc: Cloud-ready, compositionally verifiable zero-knowledge evaluation of declarative policies