

# ANTTI-JUHANA MÄKI

## Data Engineer

Passionate and experienced data guy. Currently, building resilient data solutions for the customers using modern cloud platforms and tools like Azure (ADF and DevOps tools), Databricks, Python, and PostgreSQL.



Besides data engineer tasks like developing and maintaining data pipelines and their monitoring systems, I have e.g. created a machine learning based recommendation system that was integrated to data pipelines for analysis and visualization purposes.

I am an analytical person with a strong mathematical and data analysis background. During my 15+ years at the academic world, I created several mathematical models (using FEM/COMSOL and MATLAB&Simulink), analyzed data with MATLAB, and developed different control systems, some of them with fuzzy controllers.

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**Do it today.**

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## Strengths



**eagerness to learn**



**curiosity**



**team player**



**communication**

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## Work history

3/2023–

### DATA ENGINEER, SOLITA

Building resilient data solutions for customers using modern cloud stack, currently in energy domain. Mainly, working in Azure (especially Data Factory DevOps) and using Databricks (pyspark & SQL), PostgreSQL, and migrations tools like combination of Docker+Poetry+tusker+yoyo-migrations.

In smaller customer projects and inhouse trainings I have developed & deployed Azure resources by using Bicep and Azure Pipelines, build & used Snowflake & Crosser combination to ingest and analyze industrial data (IIoT, Industrial IoT and OT-IT convergence), learnt data modeling techniques and especially Data Vault & ADE (Agile Data Engine), and built reports and analysis tools using Power BI.

10/2022–2/2023

### DATA ENGINEER, FUTURICE

I worked in a customer project related to retail business, handling their daily operational data using Azure and Azure Data Factory, PostgreSQL, Python, and Databricks. In our daily work, we used Jira, Miro, and Teams to communicate with the customer.

Before this customer project, I started as Data Engineer Trainee in Futurice Academy on fall 2022, and received following five certifications during two months period: Scrum Master PSM I, AWS Cloud Practitioner, and three Azure certs (AZ-900, DP-900, AI-900).

9/2018–10/2022

### POSTDOCTORAL RESEARCH FELLOW, TAMPERE UNIVERSITY

I worked as a postdoc in professor Pasi Kallio's team [1, 2], where I developed data engineering and analysis solutions to automatize data analysis of several challenging biosignals and data types (e.g. HDF5, .csv, image, and video). My work involved GUI development and implementation of machine learning solutions in MATLAB environment. [3-8] I also modeled several cell culture environments, for example oxygen concentration and mechanical strain of hyperelastic material, using finite element method (FEM). [9-10] Furthermore, I have developed and studied how fuzzy control could be used to enhance in vitro cell culture conditions [11].

I also worked as professor Kallio's Vice-PI in a multidisciplinary CoEBoC team that combines cell biologists and engineers together [2], and led a group of researchers developing a novel "body-on-chip" platform for vascularized 3D cell co-cultures studies (manuscript in preparation).

#### Selected References:

1. Micro- and Nanosystems Research Group, <https://research.tuni.fi/mst/>
2. CoEBoC, Centre of Excellence in Body on-Chip Research, <https://research.tuni.fi/coeboc/>
3. DatAnalyzer, <https://github.com/AnaHill/DatAnalyzer>
4. Häkli et al. (2022) <https://doi.org/10.1155/2022/9438281>
5. Häkli et al. (2021) <https://doi.org/10.1038/s41598-021-83740-w>
6. Mykuliak et al. (2022) <https://doi.org/10.3389%2Ffbioe.2022.764237>
7. Gaballah et al. (2022) <https://doi.org/10.3390/cells11061045>
8. Skogberg et al. (2022) <https://doi.org/10.1039/D1NR06937C>
9. Tornberg et al. (2022) <https://doi.org/10.1007/s10544-022-00634-y>
10. Peussa et al. (2022) <https://doi.org/10.1371/journal.pone.0268570>
11. Mäki et al. (2023) <https://doi.org/10.1109/TASE.2023.3309668>

9/2011–8/2018

## DOCTORAL RESEARCHER, TAMPERE UNIVERSITY OF TECHNOLOGY

My main responsibility in the multidisciplinary project was to develop the heat control systems for the autonomous cell cultivation platforms. [1-3] I was also heavily involved in mathematical modeling and optimization of the developed cell culture environments, mainly using FEM-based approach. [4-6] In addition, I participated in multiple other projects, where my task was mainly data analysis of various biosignals. [7, 8]

### Selected References:

1. Mäki, A.-J. Doctoral dissertation (2018), titled 'Modeling and Control of Microscale Cell Culture Environments', available in <https://urn.fi/URN:ISBN:978-952-15-4174-2>
2. Mäki et al. (2018) <https://doi.org/10.1177/2472630318768710>
3. Mäki et al. (2018) <https://doi.org/10.1109/TASE.2016.2613912>
4. Mäki et al. (2015) <https://doi.org/10.1016/j.ces.2015.06.065>
5. Mäki et al. (2015) <https://doi.org/10.1115/1.4028501>
6. Kreutzer et al. (2017) <https://doi.org/10.1016/j.jneumeth.2017.01.019>
7. Rajan et al. (2020) <https://doi.org/10.1109/ACCESS.2020.3001191>
8. Skogberg et al. (2017) <https://doi.org/10.1021/acs.biomac.7b00963>

7/2010–8/2011

## PROJECT RESEARCHER, TAMPERE UNIVERSITY OF TECHNOLOGY

My study was related to immunoassay in microchannels and how they could be used in patient diagnostic.

8/2009–7/2010

## THESIS WORKER AND RESEARCH ASSISTANT, TAMPERE UNIVERSITY OF TECHNOLOGY

I worked in OPTIMI (Optically actuated microfluidics) project funded by Academy of Finland and collaborated with researchers from Helsinki University of Technology. My task was to model and test optically induced electric fields and to study how they could be used in microfluidics applications. [1, 2]

### Selected References:

1. Master thesis (2010), titled 'Optically induced electric fields and their use in microfluidics and cell manipulation applications' is available in <https://urn.fi/URN:NBN:fi:tty-201008171286>
2. Mäki et al. (2010). 'Modeling continuous optoelectrowetting device', in Proceedings of the 2nd European Conference on Microfluidics - Microfluidics 2010, Toulouse, December 8-10, 2010, <https://researchportal.tuni.fi/en/publications/modeling-continuous-optoelectrowetting-device>

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## Education

9/2011–8/2018

## PH.D., AUTOMATION, CONTROL ENGINEERING, AND MICROSYSTEMS Tampere University of Technology

Doctoral thesis, titled 'Modeling and Control of Microscale Cell Culture Environments', is available in <https://urn.fi/URN:ISBN:978-952-15-4174-2>

Ph.D. work involved designing and implementing automation and control systems, mathematical modeling and data handling using MATLAB and Simulink, FEM simulations with COMSOL, and much laboratory and design work related to microsystems & microfluidics.

8/2002–7/2010	<b>MASTER OF SCIENCE IN TECHNOLOGY, AUTOMATION, CONTROL ENGINEERING, AND MICROSYSTEMS</b> <b>Tampere University of Technology</b> “with distinction”  Thesis, titled 'Optically induced electric fields and their use in microfluidics and cell manipulation applications', is available in <a href="https://urn.fi/URN:NBN:fi:tti-201008171286">https://urn.fi/URN:NBN:fi:tti-201008171286</a> and presented in the 2nd European Conference on Microfluidics-Microfluidics 2010, Toulouse, December 8-10, 2010.
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## Certificates

8/2025–8/2027	<b>ASSOCIATE DATA ENGINEER DATABRICKS, DATABRICKS</b> Databricks Certified Data Engineer Associate
12/2023–	<b>FUNDAMENTALS OF THE DATABRICKS LAKEHOUSE PLATFORM - DATABRICKS, DATABRICKS</b>
12/2023–	<b>GENERATIVE AI FUNDAMENTALS ACCREDITATION - DATABRICKS, DATABRICKS</b>
6/2023–	<b>INDUSTRIAL DATA HOTHOUSE - SOLITA, SOLITA</b>  In this 4-week long program, participants learned the concepts of industrial data and OT-IT convergence, edge computing and hybrid cloud in manufacturing and industrial data modelling and contextualization. We considered multiple technologies and partners, especially in Industrial IoT (IIoT) perspective, for example Snowflake, Databricks, Crosser.io, Litmus, Nokia MX Industrial Edge, cybersecurity, Docker, OPC UA, and MQTT.
4/2023–	<b>AGILE DATA ENGINE (ADE) FOR DATA ENGINEERS, AGILE DATA ENGINE</b>  The key areas of this certificate are the following: 1) introduction to using ADE, 2) Hands-on training in a streamlined data warehouse project, 3) Comprehensive theory on ADE features and data modeling concepts.  Participants can import, model, and publish data successfully after training.
12/2022–12/2025	<b>AWS CLOUD PRACTITIONER, AMAZON</b>
11/2022–	<b>AZURE AI FUNDAMENTALS (AI-900), MICROSOFT</b>
11/2022–	<b>AZURE DATA FUNDAMENTALS (DP-900), MICROSOFT</b>
10/2022–	<b>AZURE FUNDAMENTALS (AZ-900), MICROSOFT</b>

## Projects

3/2024–6/2025	<b>DATA ENGINEERING SERVICES, PRIVATE COMPANY IN FINLAND (NDA)</b>  Developing and maintaining data platform, both in data lake and relational databases.  Role: Data Engineer Industry & data: energy sector, operational & analytical Keywords: Azure, Azure Data Factory, Databricks, PostgreSQL
8/2023–12/2024	<b>DATA ENGINEERING AND ANALYTICS SERVICES, THE FOOTBALL ASSOCIATION OF FINLAND</b>  Providing data engineer and analytics services for the customer including monitoring and maintaining ADF pipelines and small-scale development on Azure.  Role: Data Engineer / Data Analyst Industry & data: sport sector, analytical Keywords: Azure, IaC, Azure Data Factory, Azure Functions, MySQL
5/2023–4/2024	<b>DEVELOPING MACHINE LEARNING CAPABILITIES, PUBLIC SECTOR ORGANIZATION IN FINLAND (NDA)</b>  Developing machine learning capabilities for the customer, using both supervised and unsupervised learning, for example creating a classifier using Databricks.  Role: Data Scientist / Machine Learning Engineer (+ hint of Data Engineer) Industry & data: public sector, data science and analytical Keywords: Databricks, Snowflake, SQL, Python & Spark, AutoML
12/2022–2/2023	<b>DATA ENGINEER WORK, FINNISH RETAIL COMPANY (NDA)</b>  I handled customer's operational data using Azure, Azure Data Factory, PostgreSQL, Python, and Databricks, and was part of the team that further developed the system to fulfill the future needs.  Role: Data engineer Industry & data: retail, operational Keywords: Azure, Azure Data Factory, PostgreSQL, Python, and Databricks
1/2021–8/2022	<b>DATANALYZER, OPEN-SOURCE PROJECT</b>  Tools to load, visualize, and analyse data using MATLAB. Available in: <a href="https://github.com/AnaHill/DatAnalyzer">https://github.com/AnaHill/DatAnalyzer</a>  Software has been used at least in the following publications: - Gaballah et al. (2022) <a href="https://doi.org/10.3390/cells11061045">https://doi.org/10.3390/cells11061045</a> - Häkli et al. (2022) <a href="https://doi.org/10.1155/2022/9438281">https://doi.org/10.1155/2022/9438281</a> - Häkli et al. (2021) <a href="https://doi.org/10.1038/s41598-021-83740-w">https://doi.org/10.1038/s41598-021-83740-w</a>  keywords: MATLAB, data analysis, MEA, hiPS-CM

2/2022–4/2022

## WRITE LATEX DOCUMENTS USING WORD, OPEN-SOURCE PROJECT

With this tool, you can write LaTeX-based documents together with co-authors that are not familiar with .tex format.

Available in: <https://github.com/AnaHill/Write-LaTeX-documents-using-Word>

Tools: Powershell, pandoc, markdown, LaTeX

Pandoc, LaTeX, and regular expression commands wrapped in Powershell scripts.

1/2021–4/2021

## PLOT FLUKE TI400 THERMAL IMAGES, OPEN-SOURCE PROJECT

Plot Thermal images from Fluke Ti400 using MATLAB.

Available in: [https://github.com/AnaHill/Plot\\_Fluke\\_Ti400\\_thermal\\_images](https://github.com/AnaHill/Plot_Fluke_Ti400_thermal_images)

Reference: Skogberg et al. (2022), <https://doi.org/10.1039/D1NR06937C>

keywords: MATLAB, PowerShell, thermal images

1/2018–12/2025

## COEBOC , TAMPERE UNIVERSITY

CoEBOC, “Centre of Excellence in Body on-Chip Research” Academy of Finland funded project for the years 2018-2025. [1] It focuses on developing and applying body on-chip (BoC) technology to improve disease modeling, drug development, and personalized medicine. This multidisciplinary research consortium brought together six research groups from Tampere University: microsystems and microfluidics, biomaterials, adult stem cells, cardiac cells, neural cells, and computational biophysics and imaging. The ultimate goal of CoEBoC is to revolutionize healthcare by enabling more accurate and efficient drug testing, as well as by discovering new tools for diagnosing and treating diseases at the cellular level.

Role: Postdoctoral Researcher in professor Pasi Kallio’s team [2], my main tasks were analyzing cell culture data, numerical simulations (FEM), acting professor Kallio’s vice-PI in CoEBoC, leading a group that developed a novel “body-on-chip” platform for vascularized 3D cell co-cultures, and designing control systems.

Industry & data: research, analytical

Keywords: microsystems, microfluidics, in vitro, iPS, adult stem cells, cardiomyocyte, neuron, imaging, FEM, control

References:

1. CoEBoC, Centre of Excellence in Body on-Chip Research, <https://research.tuni.fi/coeboc/>
2. Micro- and Nanosystems Research Group, <https://research.tuni.fi/mst/>

1/2011–12/2018

## HUMAN SPARE PARTS, TAMPERE UNIVERSITY OF TECHNOLOGY

In this multidisciplinary, research-oriented Business Finland (former TEKES) Human Spare Parts - project between Tampere Universities, the goal was to develop stem cell-based advanced in vitro models and solutions for cardiac, neural, bone, and adipose diseases and traumas. It combined tens of experts from different research fields, such as microsystems, stem cells, biomaterials, and biomedical engineering, and produced several leading edge in vitro models and solutions.

Role: Doctoral Researcher in professor Pasi Kallio's team, I was responsible for simulate and developed novel control solutions for in vitro cell culture environments. [1]

Industry & data: research, analytical

Keywords: microsystems, microfluidics, iPS, adult stem cells, biomaterials, biomedical engineering

Reference:

1. Doctoral dissertation (2018), titled 'Modeling and Control of Microscale Cell Culture Environments' is available in <https://urn.fi/URN:ISBN:978-952-15-4174-2>

## Skills

Data Analytics	5 - Expert	15 years
Data Engineering in Azure	4 - Proficient	2 years
Databases / SQL	3 - Good	2 years
Azure Data Factory	4 - Proficient	2 years
Analyzing and visualizing data	4 - Proficient	15 years
Azure Databricks	4 - Proficient	2 years
AutoML (Databricks)	1 - Basics	1 year
MATLAB	5 - Expert	15 years
Data Manipulation and Science in Python (pandas, numpy, scikit-learn, tensorflow, turtle)	4 - Proficient	3 years
Data Visualisation (Power BI)	1 - Basics	1 year
Databases: PostgreSQL, Snowflake	3 - Good	2 years
All things related to data!	4 - Proficient	15 years
AWS	1 - Basics	1 year

Consulting	4 - Proficient	3 years
CI/CD (Git / Github / Azure DevOps)	4 - Proficient	2 years
Agile Methodologies	4 - Proficient	2 years
FEM	5 - Expert	15 years
Numerical Modeling	5 - Expert	15 years
Fuzzy control	3 - Good	3 years

## Industry knowledge

Academic Research	5 - Expert	15 years
Public sector, education	4 - Proficient	10 years
Electric Energy Industry	3 - Good	1 year
Health Technology	4 - Proficient	10 years
Retail business	3 - Good	1 year
Cloud Computing	3 - Good	1 year

## Web presence

-  <https://anahill.github.io/>
-  <https://www.linkedin.com/in/antti-juhana-maki/>
-  <https://scholar.google.com/citations?user=bmCs6M0AAAAJ>



# Languages

<b>Finnish</b>	5 - Native / Fluent
<b>English</b>	5 - Native / Fluent
<b>Swedish</b>	1 - Basics
<b>German</b>	1 - Basics
<b>Chinese</b>	1 - Basics

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# Hobbies & passions

football, reading, cross country skiing, all things related to data

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