# Susumu Okazawa

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## Experience

**Savantic AB**, Senior Data Scientist — Sweden, Aug 2020 – present

- Recommended as the most efficient developer that can deliver valuable machine learning solutions despite the short project duration
- Experienced with projects of all sizes and all ML phases
- Highly regarded not only for the coding skills, but also for the ability to prioritize tasks

**TMI Associates**, Patent Attorney — Japan, Oct 2016 – present

- Expanded business of patent prosecution by 200% in the field of machine learning and quantum computer
- Presented patent strategy in the field of machine learning to pharmaceutical company and IT startups
- Supervised 3 junior attorneys

**HARUKA Patent & Trademark Attorneys**, Patent Engineer — Japan, Apr 2013 – Oct 2016

- Documented more than 100 patent specifications of software, semiconductor device, etc.
- Assisted clients with obtaining more than 100 patents in Japan, the US, Europe, China, and Korea

**Japan Society for the Promotion of Science**, Researcher — Japan, Apr 2012 – Mar 2013

## Education

**PhD** **The Graduate University for Advanced Studies**, Physics — Japan, Apr 2008 – Mar 2013

- Thesis: Non-equilibrium aspects of the black hole thermodynamics
- Scholarships: Research Fellowship for Young Scientists

**BS** **Tokyo Institute of Technology**, Physics — Japan, Apr 2004 – Mar 2008

## Skills

**Programming:** Python, OpenAI, Ollama, FastAPI, Transformers, PyTorch, Streamlit, Gradio, Apache Spark, Databricks, SQL, BigQuery, Kafka, Elasticsearch, Google Analytics, Power BI, Docker, Git, VS Code, Cursor, CI/CD, MLOps, Agile, Scrum

**Cloud Platforms:** Microsoft Azure, Google Cloud, Amazon Web Services

**Languages:** English (fluent), Japanese (native)

## Certifications

**Certified ScrumMaster (CSM)** — June 2024

**Data Science Professional** — June 2021

**Academy Accreditation - Delta Lake Essentials** — June 2021

**Japanese Patent Attorney** — Apr 2016

## Publications

**Workload assessment: Time to emanate from accurate conclusions instead of preconceived notions** — 2023

Dan Hasson, Susumu Okazawa, Karin Villaume

10.1111/joop.12436

**Natural language processing as work support in project tendering** 2022
Linda Cusumano, Rasmus Rempling, Robert Jockwer, Ricardo Alencar Saraiva, Mats Granath, Nilla Olsson, Susumu Okazawa
10.1201/9781003348443-258

## Extracurricular Activities

- A board member of Japanese School Association in Stockholm

## Projects

**Fruit Quality Assessment System** Sept 2024 – Feb 2025
Led a team to develop hardware, GUI, and ML models for non-destructive fruit quality assessment.
- Led a team to develop a hardware, a graphical user interface and machine learning models to estimate internal damage and ripeness of fruit without opening it
- Facilitated communication to achieve the fastest and the best quality of delivery
- Technologies used: Raspberry Pi, Hardware Development, Sensors, 3D printing, Python
- Methods used: IoT, Infrared spectroscopy, Agile, Scrum

**Document-based Chatbot** Sept 2024 – Oct 2024
Led a team to develop a chatbot prototype that generates answers based on internal documents.
- Led a team to develop a chatbot prototype that generates answer based on the internal document
- Mentoring new hires to get up and running as quickly as possible
- Created a CI/CD pipeline to automate container deployment to Azure
- Technologies used: Azure OpenAI, Azure AI Search, Azure Document Intelligence, Azure App Service, Gradio, GitLab CI/CD, Docker
- Methods used: Retrieval Augmented Generation (RAG), ChatGPT, Agile, Scrum, Code review

**LLM-based Consultant Profile Generator** Feb 2024 – Apr 2024
Supervised a master's thesis on generating consultant profiles using LLMs such as Mistral.
- Supervised a master's thesis aiming at the generation of an on-demand consultant profile using Large Language Models (LLMs) such as Mistral
- Gave advice on open source vector databases and LLMs
- Supported setting up infrastructures such as Azure OpenAI and RunPod (serverless GPU)
- Technologies used: Azure OpenAI, ChatGPT, Qdrant, Large Language Models (LLMs), Mistral, Serverless GPU
- Methods used: Retrieval Augmented Generation (RAG), Prompt engineering

**Data Pipeline Modernization** May 2023 – June 2024
Developed and modernized data pipelines using Azure Databricks and CI/CD tools.
- Developed several data pipelines using Azure Databricks with CI/CD tools like Github Actions
- Introduced several modern features of Databricks such as Unity Catalog, Delta Live Tables and Databricks Asset Bundles
- Developed DAX code for Power BI to process the data for dashboarding
- Technologies used: Apache Spark, PySpark, SparkSQL, Databricks, Unity Catalog, Delta Live Tables, Databricks Asset Bundles, Github Actions, Power BI, DAX
- Methods used: Data modeling, CI/CD, Agile, Scrum

**ChatGPT Document Generator** Apr 2023 – May 2023
Built a proof of concept application using ChatGPT for document generation and vector database for PDF embeddings.
- Built a proof of concept application that uses ChatGPT to create a document specific to their field of expertise
- Built a vector database to store text embedding vectors extracted from PDF documents
- Developed the prompt for ChatGPT to include the relevant past document in the context
- Technologies used: NLP, ChatGPT, Qdrant, Streamlit, Docker, Microsoft Azure
- Methods used: Prompt engineering, Agile

**ChatGPT Workshop** May 2023 – May 2023
Delivered a one-day workshop on using ChatGPT with vector search, including Python and F# code samples.
- Gave a one-day workshop for another consulting company on how to use ChatGPT with vector search

- Prepared sample code in both Python and F# because the client mainly works on .NET
- Technologies used: ChatGPT, .NET, F#
- Methods used: Workshop

**Streaming Data Processing Research** Dec 2022 – Dec 2022

Explored streaming data processing using Apache Kafka for an internal hackathon.

- Explored streaming data processing using Apache Kafka
- Prepared a stack of Confluent Kafka on an internal server for an internal hackathon
- Prepared an IoT device as a data source as well as a sample MQTT consumer
- Technologies used: Apache Kafka, MQTT, Docker-compose
- Methods used: IoT, Hackathon

**LIA Internship Supervision** Sept 2022 – Nov 2022

Supervised a LIA internship focused on practical machine learning and data analysis.

- Supervised a LIA (Lärande i Arbete) internship who aims learning machine learning in practice
- Guided the interns on how to perform exploratory data analysis on the real data
- Provided advice on how to present findings to a broader audience
- Technologies used: pandas, scikit-learn, plotly
- Methods used: Exploratory data analysis, Code review

**Machine Translation API and ML Pipelines** Sept 2022 – Apr 2023

Developed a machine translation API, ML pipelines, and a dashboard for ChatGPT testing.

- Developed a machine translation API, machine learning pipelines, and a dashboard for testing ChatGPT, which was an emerging technology
- Built the machine learning pipeline using Amazon SageMaker
- Built the translation API using FastAPI and Amazon Lambda
- Technologies used: FastAPI, AWS SageMaker, AWS Lambda, Amazon ECR, Docker
- Methods used: Machine translation, MLOps, Agile

**Mobile Device Location Estimation** Nov 2021 – June 2022

Developed ML models and algorithms for mobile device location estimation and statistics aggregation.

- Developed new machine learning models to estimate the location of mobile device based only on the ping time series
- Developed new gridding algorithms which are used in the aggregation of statistics
- Applied geospatial functions in BigQuery, taking care of the amount of data, which is a few hundred GB per day per country
- Technologies used: BigQuery, OpenStreetMap, GeoPandas, NumPy, Shapely, NumPyro, PyStan, Google Cloud, Docker
- Methods used: Exploratory data analysis, Geospatial analysis, Bayesian hierarchical model, Agile

**Physics Parameter Optimization** Feb 2022 – Apr 2022

Supported strategy and used Optuna for optimal physics parameter search in fluid property models.

- Supported a colleague in building the strategy and the customer relationship
- Suggested using Optuna to find the optimal physics parameters in the model which estimate the fluid properties flowing through pipe
- Technologies used: Optuna, scikit-learn, SciPy, NumPy, pandas
- Methods used: Exploratory data analysis, Hyper parameter tuning

**Travel Mode Detection Model** Sept 2021 – May 2022

Developed a model to estimate public transport share and travel time ratios, with dashboard presentation.

- Developed the travel mode detection model which can estimate the public transport share and the ratio of the travel time between the public transport and the private car
- Presented the results in a dashboard developed by Plotly Dash
- Technologies used: scikit-learn, SciPy, NumPy, pandas, Plotly, Dash, Docker
- Methods used: Exploratory data analysis, Data visualization

**Spare Parts Return Analysis** Nov 2021 – Dec 2021

Analyzed returns of spare parts and created SQL queries for data aggregation and visualization.

- Analyzed returns of spare parts for all kinds of car and build a basis of further analysis
- Created SQL queries which aggregate data from a bunch of tables
- Visualized the results to grasp an overview of the returns
- Technologies used: Microsoft SQL Server, pandas, Plotly
- Methods used: Exploratory data analysis, Agile

**GPT-2 Chatbot for Domestic Abuse Support** Sept 2021 – Dec 2021

Designed and trained a GPT-2 chatbot for domestic abuse support, deployed as a web API.

- Designed the training data for a GPT-2 based chatbot which consults people suffering in domestic abuse
- Trained the GPT-2 based chatbot on a GPU in Azure
- Deployed the model in Azure Functions as a web API, which can be invoked from the mobile app
- Technologies used: pandas, GPT-2, Plotly, Streamlit, Docker, Microsoft Azure
- Methods used: NLP, Training on GPU, Agile

**Procurement Document Analysis Tools** May 2021 – June 2021

Developed text analysis and visualization tools for procurement documents, published a paper with the client.

- Developed text analysis and visualization tools using Elasticsearch, Kibana, and Streamlit for procurement documents in PDF
- Deployed the applications as containerized web applications on Azure
- Published a paper in proceeding with the client
- Technologies used: Elasticsearch, Kibana, Streamlit, Docker, Docker-compose, Word2Vec, Plotly, Microsoft Azure
- Methods used: NLP, Agile

**What-if Tool for Public Transport** Mar 2021 – Apr 2021

Built a prototype what-if tool for analyzing driver and target values, with Bayesian modeling.

- Built a prototype of a what-if tool which analyzes relationship between various driver values, such as punctuality, and target values, such as customer satisfaction index
- Developed the dashboard in one week, including the requested feature and two novel features
- Developed Bayesian hierarchical models to estimate relationship between the drivers and the targets for each user group
- Technologies used: NumPy, pandas, scikit-learn, NumPyro, GPy, Plotly, Dash, Voilà, Heroku
- Methods used: Exploratory data analysis, Data visualization, Bayesian hierarchical model

**Stress Management Data Analysis** Jan 2021 – Feb 2021

Analyzed stress management app data, identified personality clusters, and published a peer-reviewed paper.

- Analyzed the questionnaire and stress-related time series data collected by a stress management application
- Identified clusters of personality traits that have strong confounding relationships with stress related variables
- Published a peer reviewed paper with the client
- Technologies used: NumPy, pandas, scikit-learn, tslearn, GPy, Matplotlib, Plotly
- Methods used: Statistical test, Time series analysis

**Customer Journey Analysis** Nov 2020 – Dec 2020

Analyzed customer journey factors using NLP and Bayesian models.

- Analyzed the factors that influence the customer journey, for example, the number of calls, personal background, and content of text messages
- Used Natural Language Processing (NLP), which involves text classification, topic modelling, and feature extraction
- Gained insights from time series analysis using Bayesian probabilistic models
- Technologies used: Gensim, PyTorch, NumPyro, Matplotlib
- Methods used: NLP, Exploratory data analysis, Bayesian probabilistic model

**Swedish Question Answering System** Oct 2020 – Nov 2020

Developed a closed domain QA system based on BERT for English and Swedish, published dataset and model.

- developed a closed domain question answering system based on BERT in English and Swedish
- Published the Swedish SQuAD 2.0 dataset and the fine-tuned model
- Established better scores on question answering task compared to the publicly available model
- Technologies used: Transformers, Google Cloud Translation, Tensorflow, PyTorch

- Methods used: Training on GPU