PANCHAMY KRISHNAN KRISHNAKUMARI

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Delft Netherlands

EDUCATION

Ph.D.: Transport And Planning
TU Delft, The Netherlands, February 2020

- Degree Awarded with *cum laude*
- Dissertation: Multiscale Pattern Recognition of Transport Network Dynamics and its Applications

Double Master of Science: Computer Science
KTH & TU Delft, Sweden & The Netherlands , August 2015

- Awarded scholarship worth 22000 Euros for pursuing EIT Digital Masters
- Thesis: Supervised learning for measuring hip joint distance in x-ray images at Clinical Graphics B.V.

PROFESSIONAL SUMMARY

Data Science and Machine Learning Professional aspiring to contribute to practical data solutions for organisations invested in accelerating the future with experience in the workflow of developing data products starting from ideation to deployment.

SKILLS

- **Programming Languages**: Python, Matlab, HTML, Javascript, CSS, Java
- **Data Analysis**: Geopandas, Pandas, NumPy, NetworkX, OSMnx
- **Machine Learning**: Scikit-learn, TensorFlow, Keras
- **Data Modeling**: Feature Engineering, Feature Importance, Regression (RF, RNN, GNN), Clustering, Classification (CNN), Image & Text Processing.
- **Data Visualization**: Plotly, Matplotlib, Bokeh, Seaborn, Kepler, Leaflet, Folium
- **Database Systems**: MySQL, PostgreSQL
- **HPC cluster**: SURF Lisa, DelftBlue, Google Cloud Platform
- **Frameworks/Tools**: Jupyter, Docker, Git, GitHub, Flask, FastAPI, Java Server Face, Angular JS, Streamlit

WORK HISTORY

December 2020 - Current
TU Delft - Assistant Professor, Delft

- Co-build a AI group of 19 PhD students and 1 postdoc in 3 years.
- Supervised more than 10 MSc students in their thesis project related to data science and machine learning topics.
- Acquired more than 2ME funding for 6 PhD students, lead the data task in a large consortium EU green deal project and involved in 2 other EU projects.
- Collaborated with multinational companies like Shell, Bol, BAM; government & non-profit organisations like RWS, NDW, Gemeente Den Haag, WMATA, Worldbank and several international universities on data science projects.
- Lead the development of the data exchange ecosystem of the EU Green Deal project for Schiphol which includes a federative database system, data loaders, ETL processes, fusion and learning services, and access management as well as the current digital infrastructure at my department.
- Authored/co-authored more than 7 conference and journal contributions in the field of network science, pattern recognition, feature engineering, and machine learning.
- Coordinated AI, data science, and programming courses for MSc and PhD students.
- Current research is focused on **complex networks**, **explainable AI**, **NLP**, and **advanced visualisation**.

February 2020 - December 2020
TU Delft - Postdoctoral Researcher, Delft

- Managed the NWO-funded project Mirrors on multiscale traffic estimation and prediction, consisting of 2 PhDs, 1 Postdoc, and 3 industrial partners.
- Build a technical data team. Set up data and coding guidelines.
- Supervised 3 MSc students and taught a BSc and MSc course.
- Organized a hackathon and seminar.

February 2016 - February 2020
TU Delft - PhD Researcher, Delft

- Awarded *cum laude* for the dissertation*,* **top 3%** of the PhDs in TU Delft.
- Authored/co-authored more than 9 conference and journal publications.
- Supervised 3 MSc students & 1 BSc student and assisted in 2 MSc courses.
- Organized more than 6 national workshops and seminars.

September 2015 - September 2018
CGI B.V. - Part-Time Consultant, Rotterdam

- Build data loader, fusion, and filtering methodologies for loop detector traffic data as MATLAB API services
- Designed and developed a web application using Java Server Face framework for visualizing 10 years of traffic data for the whole of the Netherlands.
- Developed web application prototype for traffic accessibility monitoring for Amsterdam city.
- Presented state-of-the-art research to practitioners at outreach events.

CURATED PROJECTS

Machine Learning & Data Science

- Investigated the consequences of COVID spreading in public transport networks using data analytics, complex network theory, and epidemic modeling. *(collaboration with Washington transport authority WMATA)*
- Developed a data compression method for public transport data that achieved **94%** dimensionality reduction with **90%** information retention *(collaboration with Washington transport authority WMATA)*
- Developed a short-term travel time prediction model based on image processing techniques resulting in a **44%** improvement in prediction accuracy.
- Developed a dynamic topic modeling framework to analyze the sentiments and attitudes of people toward public transport before, during, and after COVID.

Software Development

- Lead the design and implementation of a data warehouse to centralize and professionalize the data storage in the department.
- Created and deployed multiple web applications for data visualizations using HTML/CSS and presented insights to the practitioners.
- Designed and implemented a prototype for a congestion search engine, including a PostgreSQL database, Flask API services, and a web application.
- Developed an open-source graph coarsening method that reduced the road network of Amsterdam by **96%** with a limited loss of information.
- Developed Dockerized web APIs for accessing and visualizing traffic data. Set up CI/CD pipelines.