Siddharth Ramchandran

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PROFILE

I am a doctoral candidate in Machine Learning at Aalto University, Helsinki. My specialisation is in Probabilistic Modelling and Statistical Genetics. I have been actively involved over the past couple of years in the Computational Systems Biology research group.

I am currently working on unsupervised deep generative models for clinical data with an aim to build comprehensive models for multi-disease modelling that can analyse bio-bank data at a population-wide scale and covering data from individuals even from birth/early life until disease onset. My areas of research interest are Bayesian Statistical Analysis, Personalised Medicine and Neural Networks. I aspire to be a Research Scientist and apply probabilistic methods innovatively to address high-dimensional data challenges.

EDUCATION

M.Sc. in Machine Learning, Data Science and Artificial Intelligence
Minor in Bio-informatics
Aalto University, *Helsinki, Finland*
July 2019
Final CGPA: 4.7 / 5.0
Graduated with honours

B.Tech. in Information Technology
VIT University, *Vellore, India*
2016
Final CGPA: 9.73 / 10.0
Ranked #1 in a class of 243

KEY ACCOMPLISHMENTS

★ 2020
Selected for the summer school
Machine Learning Summer School (MLSS) 2020,
Tübingen, Germany

★ 2019
Selected for study grant
HICT's co-funded doctoral student position
Aalto University

★ 2019
Selected for the summer school
Deep Learning and Reinforcement Learning Summer School 2019, Edmonton, Canada

★ 2017 & 2018
Aalto School of Science Honours Student
Academic and Research excellence
Aalto University

★ 2016
Best Academic Performance in the School of Information Technology and Engineering
"Mrs. Pudukkottai S.P. Seerangammal" - Endowment Award
VIT University

★ 2013, 2014 & 2015
Academic Excellence *Merit Scholarship*
VIT University

RESEARCH EXPERIENCE

Aalto University
Helsinki, Finland (October 2018 - Present)
Doctoral Candidate, Computational Systems Biology,
Dept. of Computer Science

Working on:
- Unsupervised deep generative models for clinical data

Aalto University
Helsinki, Finland (October 2016 - September 2018)
Research Assistant, Computational Systems Biology,
Dept. of Computer Science

Worked on:
- Creating an additive Gaussian process regression model for analysis of experimental data from longitudinal study designs (See publications).
- Creating a framework to analyse gene expressions using Gaussian processes to provide a personalised approach for the early detection of biomarkers in Type 1 Diabetes and other auto-immune diseases (See publications).

Indian Institute of Technology - Bombay
Mumbai, India (December 2015 - July 2016)
Research & Development Intern

Contributed to the development of a mobile-first e-commerce platform for empowering rural India (Lokacart) and to the development of a digital storyboarding and knowledge sharing platform (Lokavidya).

Indian Institute of Technology - Madras
Chennai, India (June 2015 - July 2015)
Summer Research Fellow

Assisted with an on-going project to enhance OpendTect (a seismic interpretation software) with Machine Learning abilities that minimises human errors in data entry for ONGC. Also researched on Recommender Systems and novel ranking methods by attempting the RecSys Challenge.

PUBLICATIONS

Journal papers

- **Longitudinal variational autoencoder.**
  International Conference on Artificial Intelligence and Statistics [AISTATS] (2021), San Diego, California, USA. (to appear)
  Ramchandran, S., Tikhonov, G., Kujanpää, K., Koskinen, M. and Lähdesmäki, H.

- **Latent gaussian process with composite likelihoods and numerical quadrature.**
  International Conference on Artificial Intelligence and Statistics [AISTATS] (2021), San Diego, California, USA. (to appear)
  Ramchandran, S., Koskinen, M. and Lähdesmäki, H.

- **A personalised approach for identifying disease-relevant pathways in heterogeneous diseases.**
  Nature partner journal Systems Biology and Applications, (2020)
  Ramchandran, S., Somani, J., Lähdesmäki, H.

- **An additive Gaussian process regression model for interpretable non-parametric analysis of longitudinal data**
  Nature Communications, Vol 10, No. 1798, (2019)
  Cheng, L., Ramchandran, S., Vatanen, T., Lietzen, N., Lahesmaa, R., Vehtari, A. and Lähdesmäki, H.

- **Achieving fine-grained access control and mitigating role explosion by utilising ABE with RBAC.**
  International Journal of High Performance Computing and Networking, 10(1-2), pp. 109 -117.
  Balusamy, B., Ramchandran, S. and Priya, N.

Poster/Oral presentations

- **Deep Learning and Reinforcement Learning Summer School, July 2019, Edmonton, Canada**
  Latent Gaussian processes with composite likelihoods for data-driven disease stratification.
  Ramchandran, S., Koskinen, M. and Lähdesmäki, H.

- **36th International Conference on Machine Learning (ICML), Workshop on Computational Biology, Long Beach, CA, USA, June 14, 2019.**
  An additive Gaussian process regression model for interpretable probabilistic non-parametric analysis of longitudinal data.
  Cheng L, Ramchandran S, Vatanen T, Timonen J, Lietzen N, Lahesmaa R, Vehtari A, Lähdesmäki H

- **11th annual RECOMB/ISCB Conference on Regulatory & Systems Genomics, New York, NY, USA, Dec 8 - 10, 2018.**
  An additive Gaussian process regression model for interpretable probabilistic non-parametric analysis of longitudinal data.
  Cheng L, Ramchandran S, Vatanen T, Timonen J, Lietzen N, Lahesmaa R, Vehtari A, Lähdesmäki H

- **AI Day, December 2018, Espoo, Finland**
  Latent Gaussian processes with composite likelihoods for data-driven disease stratification.
  Ramchandran, S., Koskinen, M. and Lähdesmäki, H.

RELATED COURSES & CERTIFICATION PROGRAMMES

- Machine Learning Basic Principles
- Probability and Statistics
- Algorithmic Methods of Data Mining
- Kernel Methods
- Advanced Probabilistic Methods
- Artificial Intelligence
- Neural Networks
- Complex Networks
- Completed a certification program (50 hours) conducted by TIFAC-CORE, VIT University on Big Data Analytics using Hadoop, IBM z/OS, Machine Learning and 'R' Programming.

SKILLS

Computer Languages

Python
Matlab
C
C++
Java
R
HTML
Javascript

Software Tools & Tech

TensorFlow
Theano
Android SDK
PyTorch
Open MP
MySQL
Amazon Web Services

LANGUAGE

English
Professional/Native

Malayalam
Native

French
Limited working

Hindi
Limited working

Finnish
Elementary

Chinese
Elementary