

# Kunal Ghosh

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## EDUCATION

- **DeepBayes Summer School**  
Moscow, Aug 2019.
- **Machine Learning Summer School**  
Madrid, Aug 2018.
- **Master's in Computer Science**  
Major: Machine Learning and Data Mining  
Minor: Mathematics  
Aalto University, Helsinki, Finland  
GPA - 4.63/5  
Graduated (with Honours) Nov 2017
- **Bachelor's in Computer Science**  
Visvesvaraya Technological University  
Grad May 2011 | Bangalore, India

## COURSEWORK

### MASTER'S

- Deep Learning
- Gaussian Processes
- Kernel Methods
- Machine learning advanced probabilistic methods
- Bayesian Data Analysis
- Algorithmic Methods of Data Mining
- Convex Optimization
- Computational Science
- Programming Parallel Computers

## TEACHING

- Aalto University course on **Deep Learning**
- 2019 - TA (~250 students)
  - 2018 - TA (~250 students)
  - 2017 - TA (~250 students)
  - 2016 - Main TA, *Seminar course* (~40 students)

## SKILLS

Good with:

- Python (Including Theano, Numpy, Scipy, SciKit Learn and working knowledge of PyTorch and Tensorflow)
- Matlab & Octave
- Apache Spark

Some knowledge of:

- C
- C++ (Cuda & OpenMP)
- Stan (Probabilistic Programming)
- SQL
- Shell Scripting
- Java
- $\text{\LaTeX}$
- Apache Lucene

## WORK EXPERIENCE

### AALTO UNIVERSITY | Doctoral Candidate

June 2018 - now | Espoo, Finland

- Working on novel variational inference based methods for approximating posteriors of complex probabilistic models. Also exploring applications of Bayesian methods in materials science. Supervised by Prof. Aki Vehtari (Dept. Computer Science) and Prof. Patrick Rinke (Dept. of Applied Physics).

### AALTO UNIVERSITY | Research Assistant - Honours Program

May 2016 - August 2017 | Espoo, Finland

- Developed deep learning models to predict molecular electronic properties. Supervised by Prof. Vehtari (Dept. Computer Science) and advised by Prof. Patrick Rinke (Dept. Applied Physics).
- Studied semi-supervised extensions of the Variational Auto-Encoder and related models. Supervised by Prof. Tapani Raiko, Prof. Aki Vehtari and advised by Dr. Jyri Kivinen.

### AMAZON | Software Development Engineering in Test

Dec 2013 - Aug 2015 | Bangalore, India

### AMAZON | Quality Assurance Engineer

Aug 2011 - Nov 2013 | Bangalore, India

### OWNCLOUD.ORG | Google Summer of Code Intern

May 2011 - Aug 2011

## THESIS & PUBLICATIONS

- **Kunal Ghosh**, Annika Stuke, Milica Todorović, Peter Bjørn Jørgensen, Mikkel N. Schmidt, Aki Vehtari and Patrick Rinke. *Deep learning spectroscopy: neural networks for molecular excitation spectra*, Wiley Advanced Science, 2019. Link.
- Annika Stuke, Milica Todorović, Matthias Rupp, Christian Kunkel, **Kunal Ghosh**, Lauri Himanen and Patrick Rinke. *Chemical diversity in molecular orbital energy predictions with kernel ridge regression*, Journal of Chemical Physics, 2019. Link
- Annika Stuke, Milica Todorović, **Kunal Ghosh**, Aki Vehtari and Patrick Rinke. *Spectral property prediction with artificial neural networks*, Abstract published in Deutsche Physikalische Gesellschaft e.V. 2017, Link
- *Deep Learning for Predicting Molecular Electronic Properties.*, Master's Thesis, Aalto University, 2017, Link

## AWARDS

- 2018 **Travel Grant** (1000 €) from the Education Network in Condensed Matter and Materials Physics, Dept. of Applied Physics, Aalto University.
- 2016 Inducted into the Machine Learning **Honours Program** at Aalto University. Awarded for maintaining good progress in studies (completed 63 ECTS out of 90 in the 1st year) while maintaining good grades (4.55 out of 5)
- 2014 2<sup>nd</sup>/100 teams. Amazon Internal Machine Learning Contest.
- 2013 **99.5 percentile** in GATE 2013. 1019<sup>th</sup>/224160 candidates.
- 2004 29<sup>th</sup>/~2x10<sup>5</sup> candidates. National Talent Search Scholarship. State Level.