

Duc Nguyen

PH.D. STUDENT IN MACHINE LEARNING

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Education

University of Pennsylvania

Philadelphia, PA

DOCTOR OF PHILOSOPHY (COMPUTER SCIENCE)

May 2024 (expected)

- **Advisor:** Prof Shivani Agarwal
- **Research areas:** Structured Prediction, Learning Theory, Deep learning, Predictive Healthcare
- **Highlight classes:** Machine learning and Control, Probability

Tufts University

Boston, MA

COMPUTER SCIENCE (BS)

Sept 2015 - May 2019

SUMMA CUM LAUDE WITH HIGHEST HONORS, **GPA: 3.96/4.0**

- **Senior honor thesis:** Particle based algorithms for deep neural networks (defended with distinction)
- **Highlight classes:** Deep Neural Networks (A), Bayesian Deep Learning (A), Statistical Machine Learning (A), Graduate Convex Optimization (A-), Numerical Optimization (A), Advanced Algorithm (A), Probability and Statistics (A)

Programming skills

Programming languages	Python, Scala, C++, C Java, Matlab, SQL
Cloud and web services	Amazon Web Services, Google Clouds API, Play Framework, Django
Frameworks and libraries	Tensorflow, Pytorch, Kafka, Akka Stream, Git

Industry experience

Anduin Transactions

San Francisco, CA

SOFTWARE ENGINEERING INTERN

May. 2019 - Aug. 2019

- **Company mission:** to develop an integrated financial transaction workflow for lawyers, start up founders and venture capitals
- Built an automated build and deployment system that manages multiple AWS lambda services. Deployed the first micro-service component of the company's software system: a pdf-docx conversion tool
- Built a file activity tracking system using Kafka that allows for tracking file revisions, edits and views. Wrote a modular and reusable internal library for interacting with Kafka-Akka stream.
- **Technology stack:** Scala, Kafka, Akka-kafka, AWS lambda, Scala Build Tool

Research Projects

Learning theory

University of Pennsylvania

ADVISED BY: SHIVANI AGARWAL AND NIKOLAI MATNI

Sept 2019 -

- Studying generalization bounds of structured prediction algorithms, i.e., how well learning algorithms perform on unseen test set compared to their performance on seen training data. Focus on safety guarantees of learning algorithms in an integrated system

Structured Prediction

University of Pennsylvania

ADVISED BY: SHIVANI AGARWAL

Sept 2019 -

- Structured prediction is the generalization of traditional prediction machine learning where the inputs and outputs are complex structures, ie sentences, sequences, trees, graphs, etc
- Studying classic structured prediction algorithms (such as M3N, CRF, StructSVM) and recent advances in structured prediction (search-based structured prediction, integration of deep learning and structured prediction)
- Collaborating with the School of Medicine to apply structured prediction in treatments for PTSD patients

Deep learning (senior honor thesis)

Tufts University

THESIS COMMITTEE: SHUCHIN AERON, MICHAEL HUGHES AND LIPING LIU

Sept 2018 - May 2019

- Studied particle based algorithms (Hamiltonian Monte Carlo and Stein Variational Gradient Descent) and apply to the training of deep neural networks. Formulated an ensemble algorithm of neural networks trained using particle based algorithms
- Applied Bayesian deep learning to the drug discovery problem
- Applied convolution neural networks to the sports prediction problem (NBA game prediction)
- Published findings to complete senior honor thesis

Tensor Decomposition

Tufts University

ADVISED BY: RONI Khardon and Shuchin Aeron

Sept 2017 - Aug 2018

- Studied variational inference and stochastic variational inference. Applied variational inference to the generalized tensor decomposition problem, i.e., generic algorithm for integer, real and binary tensor composition
- Applied variational tensor decomposition to the word embeddings problem and foreign relation analysis. Presented findings at Tufts University summer research symposium.