# DONGPING QI

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## EDUCATION

**Cornell University**                                                                 *08/2017 – Exp. 05/2023*
Ph.D. in Applied Mathematics
Adviser: Alexander Vladimirsky

**Shanghai Jiao Tong University**                                                   *09/2013 – 06/2017*
B.S. in Mathematics (Zhiyuan Honor Program)

## SKILLS

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|---|---|
| **Programming Languages** | C++, Python, TensorFlow, MATLAB, Julia |
| **Software & Tools** | Linux, GitHub, LaTeX |

## WORK EXPERIENCE

**Network Software Engineer Internship**
Google,                                                                                       *08/2022 - 12/2022*

Work with the Global Network team on network topology optimization and capacity planning project.

**Motion Planning Software Engineer Internship**
Aurora Innovation,                                                                          *05/2022 - 08/2022*

Work with the Motion Planning team on building safer and faster driving strategies.

## RESEARCH EXPERIENCE

**High-Performance Deep Learning Algorithms Using Dynamical Systems**
Lawrence Livermore National Laboratory (virtual), NSF MSGI                    *06/2020 - 08/2020*

Research about interpretable deep neural networks and connections between deep learning and continuous dynamical systems.

Together with my mentors, I implemented a new type of neural network, named "SpliNet", which uses B-Spline basis functions to parameterize the layer weights and biases. The performance and robustness of this neural network has been tested on various supervised learning problems. SpliNet in general improves training accuracy and provides more robust predictions.

## PUBLICATIONS

1. D. Qi, D. Bindel, A. Vladimirsky, "Surveillance Evasion Through Bayesian Reinforcement Learning." *Submitted for publication.*

2. S. Günther, W. Pazner, D. Qi, "Spline parameterization of neural network controls for deep learning." *arXiv preprint arXiv:2103.00301.*

3. D. Qi, A. Dhillon, A. Vladimirsky, "Optimality and robustness in path-planning under initial uncertainty." *Submitted for publication.*

4. D. Qi, A. Vladimirsky, "Corner cases, singularities, and dynamic factoring." Journal of Scientific Computing 79/3: 1456–1476 (2019).

## TALKS & POSTERS

SpliNet: Modeling Neural Network Using B-Splines                        08/27/2020
NSF MSGI Virtual Presentation

Path Planning Under Initial Uncertainty                        10/22/2019
Algorithms for Threat Detection Workshop (poster session), George Washington University

Rarefaction Fans and Dynamic Factoring in Eikonal Equation                        07/17/2019
International Congress on Industrial and Applied Mathematics (ICIAM), Valencia, Spain

## COURSEWORK

| | |
|---|---|
| Real & Functional Analysis | Linear Programming |
| Convex Optimization | Matrix & Sparse Matrix Computations |
| Dynamical Systems | Partial Differential Equations |
| Probability & Stochastic Processes | Parallel Computing |
| Machine Learning for Intelligent Systems | Numerical Data Science |
| Reinforcement Learning | |

## RESEARCH INTERESTS

- Numerical Analysis; Computational Mathematics; Scientific Machine Learning.

- Optimal Control; Path Planning; Planning Under Uncertainty; Reinforcement Learning.