

# Yue Guan

T: (470)-399-0447 | M: yguan44@gatech.edu | 9302 Westchester LN, Atlanta, GA 30345

Applying for a summer internship related to reinforcement learning

## Education

### Georgia Institute of Technology

Atlanta, GA

- Ph.D in Aerospace Engineering, GPA 3.91/4.00

August 2020 – Present

*Advised by Dr. Panagiotis Tsiotras*

*Research field: Optimal Control, Deep Learning, Reinforcement Learning, Game Theory*

- M.S. in Computer Science, GPA 4.00/4.00
- M.S. in Aerospace Engineering, GPA 3.90/4.00
- B.S. in Aerospace Engineering, Minor in Mathematics, GPA 3.99/4.00

August 2018 – Present

August 2018 – May 2020

August 2014 – May 2018

## Research Projects and Publications

### Soft Nash Q2-Learning – Research project, Dynamics and Control Systems Lab, Georgia Tech

*Learning Nash Equilibria in Zero-Sum Stochastic Games via Entropy-Regularized Policy Approximation* [currently under review at IJCAI-21 (International Joint Conference on Artificial Intelligence)]

*Bounded-Rational Pursuit-Evasion Games* [accepted at American Control Conference 2021 (invited paper)]

- Proposed a multi-agent learning algorithm with entropy-regularized policy approximation which outperforms other learning algorithms with 10x speedup. Proved theoretical guarantee regarding convergence to a Nash equilibrium.
- Implemented the algorithm and the game environments using **Python, Numpy, Scipy, Matplotlib**.
- Currently working on leveraging deep neural network to extend the algorithm to high-dimensional space via **PyTorch**.

### Aerodynamic Interaction between Coaxial Rotors – Research project, Institute of Helicopter, TU Munich

- Implemented a multi-grid partition in **C++** for TAU-CFD code with 5x faster convergence speed. This CFD code is used by the German Aerospace Center.
- Conducted 2D/3D unsteady CFD simulations with TAU-CFD code.
- Generated high quality mesh with **ANSYS ICEM CFD** and **Pointwise**.

### Multi-Agent Hierarchical Reinforcement Learning – Course project, Deep Learning, Georgia Tech

- Developed a hierarchical reinforcement learning scheme for multi-agent system with deep neural network via **PyTorch**. Currently drafting a conference paper.
- Created nested hierarchical policies that enables learning in environments with sparse rewards.

### Market Analysis for High Throughput Satellites (HTS) – Research project, Space System Design Lab, Georgia Tech

*Review of High Throughput Satellites: Market Disruptions, Affordability-Throughput Map, and the Cost Per Bit/Second Decision Tree* [published in IEEE Aerospace and Electronic Systems Magazine 2019]

*Monte-Carlo value analysis of High-Throughput Satellites: Value levers, tradeoffs, and implications for operators and investors* [published in PloS one 2019]

- Collected price and performance data of different communication satellites.
- Conducted data analysis via model fitting and hypothesis testing with **R**.

## Skills

**Programming:** Python, C++, MATLAB, R

**Framework and libraries:** PyTorch, Tensorflow, Numpy, Scipy, Matplotlib, GPOPS-II (NASA Optimal Control Package)

**Software:** SolidWorks, AutoCAD, CATIA, ANSYS FLUENT, PointWise

**Others:** Linux, Git

## Awards

- Recipient of Outstanding Teaching Assistant from Georgia Tech Math Department (two recipients per semester)
- Recipient of DAAD (German Academic Exchange Service) Scholarship
- Recipient of Halle Foundation Scholarship