

# SIDDARTHA DEVIC

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## EDUCATION

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### University of Southern California

*August 2021 - Present*

Ph.D. Computer Science

GPA: 3.9

Co-advised by Prof. Vatsal Sharan and Prof. Aleksandra Korolova

Interests: theoretical machine learning, algorithmic fairness

### The University of Texas at Dallas

*August 2017 - May 2021*

B.S. Mathematics, B.S. Computer Science

Summa Cum Laude, GPA: 3.98

CS<sup>2</sup> Computer Science Honors Program, Collegium V Interdisciplinary Honors Program

## RESEARCH EXPERIENCE

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### Markov Lab

*October 2017 - May 2021*

*Student Researcher and NSF REU Program, UT Dallas*

- Reinforcement learning and convex optimization research with Prof. Nick Ruozzi and Prof. Ben Raichel.
- Convex function fitting with applications in reinforcement learning.
- Piecewise linear convex hulls in kernel space for function representation and minimization.

### Advanced Networks Research Lab

*April 2018 - December 2020*

*Student Researcher, UT Dallas*

- Applied machine learning and convex optimization research with Prof. Jason Jue.
- Agent-based “progressive recovery” for networks with theory and reinforcement learning in graphs.
- Online convex optimization (OCO) for *fair* online resource allocation in bandwidth management.
- Inference-time failure resilient distributed neural networks using novel training techniques.

### Washington University in St. Louis

*Summer 2020*

*Research Intern, WashU Computer Science & Engineering NSF REU Program*

- Reinforcement learning theory research with Prof. Brendan Juba (work from home due to COVID-19).
- Fully polynomial time reinforcement learning in exponential sized MDPs with linear value functions.
- Theoretical reinforcement learning for episodic regret bounds with a polynomial-time oracle planner.

### Johns Hopkins Applied Physics Labs

*Summer 2019*

*Research Intern*

- Machine learning research with the Machine Perception group, supervised by Vickram Rajendran.
- AI and machine learning research with the Machine Perception group in Tactical Intelligent Systems.
- Active secret clearance (2029) for classified defense projects dealing with object detection.
- Developed active learning framework for Keras and Pytorch; rapid prototyping of ML models.

### Future Immersive Virtual Environments Lab

*Summer 2017*

*Student Researcher, UT Dallas*

- Human-computer interaction research with Prof. Ryan P. McMahan.
- Novel method for physical object selection and representation in virtual reality.
- Prototyped in Unity3D for the HTC VIVE headset as part of Clark research program for pre-freshman.

## PUBLICATIONS

(\* denotes equal contribution / alphabetical order)

### **Polynomial Time Reinforcement Learning in Correlated FMDPs with Linear Value Functions**

Zihao Deng\*, Siddhartha Devic\*, Brendan Juba\*.

*AISTATS 2022. Also at Neurips 2021 Workshop on Ecological Theory of Reinforcement Learning.*

### **Dynamic Bandwidth Allocation for PON Slicing with Performance-Guaranteed Online Convex Optimization**

Genya Ishigaki, Siddhartha Devic, Riti Gour, Jason P. Jue.

*IEEE GLOBECOM 2021.*

### **Failout: Achieving Failure-Resilient Inference in Distributed Neural Networks**

Ashkan Yousefpour, Brian Q Nguyen, Siddhartha Devic, Guanhua Wang, Aboudy Kreidieh, Hans Lobel, Alexandre M Bayen, Jason P Jue.

*ICML 2020 Workshop on Federated Learning for User Privacy and Data Confidentiality.*

### **DeepPR: Progressive Recovery for Interdependent VNFs with Deep Reinforcement Learning**

Genya Ishigaki, Siddhartha Devic, Riti Gour, Jason P. Jue.

*IEEE Journal on Selected Areas in Communications, 2020. Also appeared at IEEE GLOBECOM 2019.*

## POSTERS & TALKS

Learning Quickly in MDPs with Many States *(USC Theory Lunch 2022)*

Gradient Descent and Clustering in Hyperbolic Space *([Slides](#), [Report](#), Graduate Course Project 2020)*

Online PR with Bounded Regret *([Poster](#), UTD Undergraduate Research Contest 2020)*

Point Packing in Hypercubes *([Slides](#), UTD Mathematics Problem Solving Group 2019)*

ALICE for Deep Active Learning *(Talk, Johns Hopkins Applied Physics Labs 2019)*

Failure-Resilient Distributed Deep Learning Inference *(Poster, Huawei Future Networks Summit 2019)*

Convex Functions for Reinforcement Learning *([Poster](#), UTD Undergraduate Research Contest, 2019)*

Robust Optimization with Applications in Networking *([Slides](#), UTD Graduate Seminar, 2019)*

A Reinforcement Learning Based Approach to Networking *([Slides](#), UTD Graduate Seminar, 2019)*

Improving Generalization in Neural Networks Through Margin Maximization *([Poster](#), UTD, 2018)*

Digitally Representing Physical Objects for Collision Avoidance in VR *([Poster](#), Clark Program, 2017)*

## AWARDS, ACADEMIC ACHIEVEMENTS, & SUMMER PROGRAMS

UCLA IPAM Graduate Summer School on Algorithmic Fairness *2022*

DoD National Defense Science and Engineering Graduate (NDSEG) Fellowship *2021*

NSF Graduate Research Fellowship Program (GRFP) Honorable Mention *2021*

Barry Goldwater Scholar Nomination (one of four STEM students representing UT Dallas) *2020*

Jonsson School Undergraduate Research Award (awarded to ten engineering students) *2019-2020*

UT Dallas Undergraduate Research Scholar Award (academic-year research support) *2018-2019*

Intel Innovate FPGA Top 20 (national semi-finalist, YOLO for traffic safety) *2018*

School of Engineering Dean's List (top 10% within engineering) *4 of 5 Semesters*

UT Dallas Academic Excellence Scholarship (full undergraduate tuition + stipend) *2017 - 2021*

Anson L. Clark Undergraduate Research Scholar (participant & advisor) *Summers 2017, 2018*

## MENTORSHIP

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Jayron Martinez (High School Student): Bias in Machine Learning Algorithms *Summer 2022*

## STUDENT ACTIVITIES

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**ACM UTD Chapter President** Led the largest CS organization at UTD (70 officers, 700+ Members). I proposed and established a **\$30k perpetual endowed scholarship** with club funds. Coordinated student-based semester long technical projects, mentorship programs, a 750+ person hackathon, funding for student startups, industry talks, and more. *8-10 hours/week, March 2018 - Dec. 2020.* [[site](#)]

**Empower Through Code** Organized and attend weekly STEM workshops for at-risk middle school girls in low income areas, exposing them to engineering and developing critical thinking. *2-3 hours/week, Oct. 2018 - March 2020 [COVID-19].*