

# SIDDARTHA DEVIC

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## EDUCATION

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### **The University of Southern California**

*August 2021 - Present*

Ph.D. Computer Science

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

### **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

## TECHNICAL SKILLS

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### **Machine Learning**

Python, Tensorflow, Keras, PyTorch, OpenCV, sklearn

### **Programming & Software**

Java, C++, Linux, C#, C, vim, git,  $\text{\LaTeX}$ , Unity3D, QT, MIPS

## 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

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### **Polynomial Time RL in Correlated FMDPs with Linear Value Functions**

Siddhartha Devic, Zihao Deng, Brendan Juba.

*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 (Long talk).*

### **DeepPR: Progressive Recovery for Interdependent VNFs with Deep RL**

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

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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

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DoD National Defense Science and Engineering Graduate (NDSEG) Fellowship 2021 - 2024

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 tuition + stipend) 2017 - 2021

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

## 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].*

## RELEVANT UNDERGRADUATE DEGREE COURSES

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**Graduate** - Optimization in Machine Learning

**Honors** - Data Structures and Algorithms, Operating Systems, Computer Architecture, Differential Equations, Discrete Mathematics II, Automata Theory, Programming Languages, Digital Logic and Computer Design.

**Normal** - Topology, Advanced Algorithms, Machine Learning, Mathematical Analysis I & II, Abstract Algebra I & II, Numerical Analysis, Databases, Differential Geometry, Probability, Statistics, Complex Variables, Linear Algebra, Calculus I, II, & III.