SIDDARTHA DEVIC

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Interests: I am broadly interested in (1) algorithmic fairness, especially in the presence of uncertainty, finite resources, and ranking/two-sided marketplaces; (2) theoretical machine learning; and (3) and concepts connecting the two areas, such as fair classification or statistical aspects of fair ML.

EDUCATION

University of Southern California — *August 2021 - Present*
Ph.D. Computer Science — GPA: 3.9/4
Co-advised by Prof. Vatsal Sharan and Prof. Aleksandra Korolova
Funding: DOD National Defense Science and Engineering Graduate (NDSEG) Fellowship
Coursework: convex optimization, online learning, theoretical machine learning, advanced algorithms

The University of Texas at Dallas — *August 2017 - May 2021*
B.S. Mathematics, B.S. Computer Science — Summa Cum Laude, GPA: 3.98/4
CS^2 Computer Science Honors Program, Collegium V Interdisciplinary Honors Program

RESEARCH EXPERIENCE

Theory Group — *August 2021 - Present*
Student Researcher, University of Southern California

- Fairness in ranking and bipartite matching (Profs. David Kempe, Vatsal Sharan, Aleksandra Korolova).
- Learning halfspaces with restricted Massart noise, multicalibration (Prof. Vatsal Sharan).
- Investigating learning and regularization (Profs. Shaddin Dughmi, Vatsal Sharan, Shang-Hua Teng).

Markov Lab — *October 2017 - May 2021*
Student Researcher and NSF REU Program, UT Dallas

- Reinforcement learning and convex optimization research (Profs. Nicholas Ruozzi, Benjamin Raichel).
- Convex function fitting and computational geometry with applications in reinforcement learning.

Advanced Networks Research Lab — *April 2018 - December 2020*
Student Researcher, UT Dallas

- Applied machine learning and convex optimization research in computer networking (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.

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.

Johns Hopkins Applied Physics Labs — *Summer 2019*
Research Intern

- Machine learning research with the Machine Perception group, supervised by Vickram Rajendran.
- AI and deep learning research with the Machine Perception group in Tactical Intelligent Systems.

Future Immersive Virtual Environments Lab — *Summer 2017*
Student Researcher, UT Dallas

- Human-computer interaction research (Prof. Ryan P. McMahan).
- Novel method for physical object selection and representation in virtual reality.

Stability and Group Fairness in Ranking with Uncertain Predictions
Siddartha Devic, Aleksandra Korolova, David Kempe, Vatsal Sharan.
Preprint available upon request, submitted.

Regularization and Optimal Multiclass Learning
($\alpha\beta$) Julian Asilis, Siddartha Devic, Shaddin Dughmi, Vatsal Sharan, Shang-Hua Teng.
Preprint, submitted.

Fairness in Matching under Uncertainty
Siddartha Devic, David Kempe, Vatsal Sharan, Aleksandra Korolova.
ICML 2023. Also non-archival at ACM conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO 23).

Polynomial Time Reinforcement Learning in Correlated FMDPs with Linear Value Functions
($\alpha\beta$) Zihao Deng, Siddartha 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, Siddartha Devic, Riti Gour, Jason P. Jue.
IEEE GLOBECOM 2021.

Failout: Achieving Failure-Resilient Inference in Distributed Neural Networks
Ashkan Yousefpour, Brian Q Nguyen, Siddartha Devic, Guanhua Wang, Aboudy Kreidieh, Hans Lobel, Alexandre M Bayen, Jason P Jue.
Workshop on Federated Learning for User Privacy and Data Confidentiality at ICML 2020.

DeepPR: Progressive Recovery for Interdependent VNFs with Deep Reinforcement Learning
Genya Ishigaki, Siddartha Devic, Riti Gour, Jason P. Jue.
IEEE Journal on Selected Areas in Communications, 2020. Also appeared at IEEE GLOBECOM 2019.

AWARDS, ACADEMIC ACHIEVEMENTS, & ACADEMIC PROGRAMS ATTENDED

DOD National Defense Science and Engineering Graduate (NDSEG) Fellowship	*2021-2024*
USC Graduate School Research Award (1500$ Travel grant)	*2023*
USC Center for AI in Society (CAIS) Poster Presentation Honorable Mention	*2023*
UCLA IPAM Graduate Summer School on Algorithmic Fairness (Travel grant)	*2022*
USC Viterbi Fellow (One year of funding for top students in entering PhD cohort)	*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 grant)	*2018-2019*
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*

POSTERS & TALKS

Regularization and Optimal Multiclass Learning   *(Talk, Harvard CS theory seminar (TGINF), 2023)*

(Talk, USC ML and Lunch seminar 2023)

Fairness in Matching under Uncertainty   *(Poster, ICML 2023)*

(Poster, EAAMO 2023)

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)*

MENTORSHIP

Dutch Hansen - Multicalibration of neural networks.   *Undergraduate, January 2023 - Present*
• USC CURVE undergraduate research program. Our work is on empirical aspects of multicalibration.

Jayron Martinez - Bias in Machine Learning Algorithms [poster].   *HS senior, Summer 2022*
• Part of the USC SHINE program. After the program, I spent an additional 6 months working with Jayron helping him apply to universities. He is now an undergraduate at USC!

STUDENT ACTIVITIES

VGSA Department Senator Elected to represent the Computer Science department as part of the graduate student association. Organized events and career opportunities for Masters and PhD students. *5 hours/week, 2021-2022 Academic year.* [VGSA]

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.* [ACM]

Empower Through Code Organized and attended 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].*