SIDDARTHA DEVIC

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EDUCATION

The University of Texas at Dallas *August 2017 - May 2021*

B.S. Mathematics, B.S. Computer Science — GPA: 3.97/4.0

CS^2 Computer Science Honors Program, Collegium V Interdisciplinary Honors Program

TECHNICAL SKILLS

Machine Learning	Python, Tensorflow, Keras, PyTorch, OpenCV, sklearn
Programming & Software	Java, C++, Linux, C#, C, vim, git, LaTeX, Unity3D, QT, MIPS

WORK & RESEARCH EXPERIENCE

Washington University in St. Louis *June 2020 - October 2020*

Research Intern, WashU Computer Science & Engineering NSF REU Program

- Machine learning theory research with Prof. Brendan Juba (remote 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

- 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.
- Unclassified fundamental research project investigating deep active learning with "Accurate Layerwise Interpretable Confidence Estimation" (ALICE).
- Developed active learning framework for Keras and Pytorch; rapid prototyping of ML models.

Advanced Networks Research Lab *April 2018 - Present*

Student Researcher, UT Dallas

- Applied machine learning and convex optimization research under the guidance of 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.

Markov Lab *October 2017 - Present*

Student Researcher, UT Dallas

- Fundamental machine learning research under the guidance of Prof. Nick Ruozzi and Prof. Ben Raichel.
- NSF REU supplement funding for work on "Giving Form to Data with a Geometric Scaffold".
- Iterative and stochastic convex function fitting with applications in reinforcement learning.
- Piecewise linear convex hulls in kernel space for arbitrary function representation and minimization.
- Investigating maximum margin neural networks for improved generalization [blog].

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.

CONFERENCE AND WORKSHOP PUBLICATIONS

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

Guardians of the Deep Fog: Resilient DNN Inference from Edge to Cloud
Ashkan Yousefpour, <u>Siddartha Devic</u>, Brian Nguyen, Alan Liao, Abdul Rahman Kreidieh, Alexandre M. Bayen, Jason P. Jue.
ACM AIChallengeIoT Workshop, 2019.

JOURNAL ARTICLES

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

MANUSCRIPTS

ResiliNet: Failure-Resilient Inference in Distributed Neural Networks
Ashkan Yousefpour, Brian Q Nguyen, <u>Siddartha Devic</u>, Guanhua Wang, Aboudy Kreidieh, Hans Lobel, Alexandre M Bayen, Jason P Jue.
arXiv:2002.07386v3, In Preparation.

POSTERS & TALKS

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)*

ACADEMIC ACHIEVEMENTS

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

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

Barry Goldwater Scholar Nomination (selected as one of four STEM students to represent UT Dallas in one of the most prestigious national undergraduate research scholarships) *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 [writeup]) *2018*

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

UT Dallas Academic Excellence Scholarship (Honors level, includes full tuition + stipend) *2017 - 2021*

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

STUDENT ACTIVITIES

ACM UTD Chapter President Lead the largest CS organization at UTD (70 officers, 700+ Members). I proposed and established a $30k perpetual endowed scholarship with club funds. We coordinate 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 Organize 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 COURSES (BY MAY 2021)

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.