Andrei Staicu

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EDUCATION

California Institute of Technology <div align="right">Pasadena, CA</div>
BS in Mathematics, Minor in Computer Science; GPA 3.9 <div align="right">*2020 - 2024*</div>
Relevant Courses: Algebraic Geometry, Complexity Theory, Commutative Algebra, Real & Complex Analysis,
Computability Theory, Differential Topology, Probability and Statistics, Data Structures and Algorithms, Systems

RESEARCH AND EXPERIENCE

Duke, Research Assistant *Laber Labs* <div align="right">Aug 2024 – Present</div>
- Implemented a Video Vision Transformer to detect different actions of a correct hand wash, as defined by WHO
- Current model has the highest accuracy submission on Kaggle on the WHO dataset with 80% accuracy

Caltech, Theoretical Computer Science Researcher *Prof. Schulman Theory Group* <div align="right">Jan 2023 – Aug 2024</div>
- Led weekly research group meetings; established foundation in algebraic geometry and representation theory
- Co-authored paper [1], proved Theorem 17, improved existing bound on identifiability from exponential to linear
- Proved an optimal identifiability bound from quadratic to linear with alternate assumptions
- Proposed novel algorithm and led research to achieve identifiability consistent with the bound proved in [1]

Caltech, Theoretical Computer Science Researcher *Prof. Umans Theory Group* <div align="right">Sep 2022 – Sep 2023</div>
- Read and presented recent advancements in bounds for group theoretic matrix multiplication algorithms
- Held weekly meetings and wrote code in SageMath that tested the standard constructions to make conjectures

Caltech, Head Teaching Assistant *for Ma 5/105b "Rings and Modules"* <div align="right">Jan 2023 – Mar 2023</div>
- Held bi-weekly office hours, graded and provided feedback to 20 students' homework and exams
- Wrote solutions to problem sets and exams; at times providing multiple approaches to solve problems

University of Copenhagen, Mathematics Researcher *mentored by Dr. Das* <div align="right">Jun 2022 – Aug 2022</div>
- Computed [2] all counts for 7-arcs in char. 2 and a majority of twisted 8-arcs in odd char., all are novel results
- Presented results to the Dept Math, U Copenhagen, and the Caltech SURF Seminar Day 2022

PAPERS

1. Gordon, S. L., Kant, M., Ma, E., Schulman, L.J., and **Staicu, A.** (2024). "Identifiability of Product of Experts Models". In *International Conference on Artificial Intelligence and Statistics* (pp. 4492-4500)
   - Showed identifiability of product of experts models in *linearly* many observables, previous was exponential
   - Showed the bound is optimal for uniform priors and within a factor of two of optimal for non-uniform priors

2. **Staicu, A.** (2023) "Counting 7-Arcs in Projective Planes over Finite Fields" arXiv preprint arXiv:2311.16578 *to be submitted for journal publication*
   - Computed all counts for twisted 7-arcs in characteristic 2, these results compute certain cohomology groups

HONORS AND AWARDS

- The Bhansali Family Prize in Computer Science for Outstanding Research ($500) <div align="right">2024</div>
- George W. Housner Student Discovery Fund ($4,930) <div align="right">2024</div>
- Caltech Summer Undergraduate Research Fellowship (SURF) <div align="right">2021, 2022, and 2023</div>
- Apostol Award for Excellence in Teaching in Mathematics ($500) <div align="right">2023</div>
- Travel Award for Symposium on Theory of Computing (STOC) in Orlando, Florida <div align="right">2023</div>

PROJECTS

Finite Field Linear Algebra Library | *C++* <div align="right">Dec 2022 – Present</div>
- Built representation of finite fields using polynomials and numerical methods from Computational Number Theory by Henri Cohen; approximately 12,000 lines of *C++* code
- Implemented probabilistic method for calculating irreducible polynomials over $\mathbb{F}_p$ of arbitrary degree

TECHNICAL SKILLS AND INTERESTS

Computer Skills: Python, C, C++, Java, JavaScript, R, MATLAB, OCaml, HTML, CSS
Developer Tools: PyTorch, NumPy, SciPy, Pandas, SvelteKit, Tailwind CSS
Interests: Tennis, Golf, Poker, Chess, Piano, Filmmaking