THOMAS BRENDAN COHN

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EDUCATION

UNIVERSITY OF MICHIGAN, Ann Arbor *September 2017 - Present*
College of Engineering – Computer Science BSE (Expected May 2022)
College of LSA – Honors Mathematics BS (Expected May 2022)
Minor in Statistics, Minor in Music

- Engineering Honors Program
- Dean's List
- Tau Beta Pi Honor Society
- Phi Kappa Phi Honor Society
- Bell Scholarship
- Regents Merit Scholarship
- Raab Family Scholarship
- Wanda W. Lincoln Scholarship

GPA: 3.68/4.00

EXPERIENCE

LABORATORY FOR PROGRESS, University of Michigan *May 2016 - Present*
Research Assistant to Professor Chad Jenkins
Major Projects:

- Manifold Learning via Nonparametric Belief Propagation
  - Accurately infer tangent spaces of high dimensional data on a manifold
  - Denoise neighborhood graph to find an accurate embedding
  - Published as **TSBP: Tangent Space Belief Propagation for Manifold Learning**. *Robotics and Automation: Letters.* 2020; 5.4; 6694-6701
- Topologically-Informed Atlas Learning for Dimensionality Reduction
  - Embed manifold data with an atlas of coordinate charts
  - Robustly assign domains based on observed data topology
  - Used to process human motion capture data and build kinematic models for articulated objects
  - Under review at IEEE, preprint available at `https://arxiv.org/abs/2110.00429`
- Coordinate Chart Particle Filter for Deformable Object Pose Estimation
  - Learn a latent representation of deformable objects using manifold learning
  - Coordinate chart enables efficient particle fitler convergence for localization
- Particle-Based Localization and Grasping of Grocery Bags
  - Detect handles in camera feed using SVM trained on Histogram of Oriented Gradients
  - Triangulate 3D location by moving robot while running 2-stage particle filter

COLLEGE OF ENGINEERING, University of Michigan *January 2019 - Present*
Instructional Aide – Introduction to Microprocessor Computing Systems (Winter 2019, Winter 2020)
– Introduction to AI and Programming (Fall 2021)

- Hold office hours, teach lab sections, help students with lab work and projects

Michigan Marching Band, University of Michigan *January 2017 - Present*
Member; Rank Leader since December 2019

- In charge of the cymbal section of the drumline

Green Ladder Technologies LLC *May 2015 - August 2015*
Contracted Developer

- Programmed embedded controllers for in vitro fertilization clinic air quality monitoring systems

SKILLS

- Programming Languages: Proficient in C++, Python, and JavaScript; familiar with C, Matlab
- Computing Tools: Proficient in Git, Bash, ROS, and LaTeX
- Mathematics: Graduate-level coursework in probability theory, graph theory, linear algebra, topology, differentiable manifolds, abstract algebra, Riemannian geometry, and convex optimization.