

Curriculum Vitae

Jackson A. Killian

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EDUCATION

Ph.D. Computer Science (in progress) <i>Harvard University, Boston, MA</i>	(Aug 2019 – present) School of Engineering and Applied Sciences
Ph.D. Computer Science (transferred) <i>University of Southern California, Los Angeles, CA</i>	(Aug 2018 – Aug 2019) Viterbi School of Engineering
B.S. Physics, Computer & Information Science <i>Ohio State University, Columbus, OH</i> Overall GPA (4.00 scale): 3.994	(Aug 2013 – May 2018) Arts and Sciences Honors College Summa Cum Laude / Honors Research Distinction

RESEARCH EXPERIENCE

Ph.D. Research Fellow – Computer Science <i>Harvard University, Boston, MA</i> Advisors: Dr. Milind Tambe (previously Dr. Bistra Dilkina, USC, 2018-19) <ul style="list-style-type: none">Derive new theory for Restless Bandits to facilitate sequential health intervention planning in low-data regimesBuild deep learning models to predict patient adherence to tuberculosis (TB) medications in IndiaDevelop large-scale agent-based simulations to model the dynamics of COVID-19 in different populationsCollaborate with international teams across government, NGOs and academia to address public health challenges	(Aug 2018 – present)
Ph.D. Research Intern – Computer Science <i>Microsoft Research India</i> Advisor: Amit Sharma <ul style="list-style-type: none">Design counterfactual explanation method for machine learning models meant for healthcare workers in IndiaLead workshop with researchers and TB experts in India to identify opportunities for AI to support patient careBuild relationships with non-profit organizations and state health officials in Bangalore and Mumbai	(Jun 2019 – Aug 2019)
Undergraduate Thesis – Computer and Information Science <i>Ohio State University, Columbus, OH</i> Advisors: Dr. Kevin Passino and Dr. Arnab Nandi <ul style="list-style-type: none">Design study to gather smartphone sensor data and Transdermal Alcohol Content (TAC) from 19 studentsCreate mobile application and server to continuously collect and send sensor data over 12 hoursProcess noisy accelerometer and TAC signals and design filters to ease downstream analysis using MATLABExtract features from signals and design intelligent systems to make classifications using MATLAB and Python	(May 2017 – Apr 2018)
Undergraduate Research Fellowship – Biophysics <i>Ohio State University, Columbus, OH</i> Advisors: Dr. Ralf Bundschuh and Dr. Pearly Yan <ul style="list-style-type: none">Design computational workflow to make low-quality cancer samples useable in modern sequencing experimentsUtilize Ohio Supercomputing Center and bioinformatics software to quantify degradation in sequencing dataAdapt software based on discovered effects to improve sequencing data quality enabling downstream research	(May 2016 – May 2017)
Undergraduate Research Assistant – Biophysics <i>Ohio State University, Columbus, OH</i> Advisors: Dr. Ralf Bundschuh and Dr. Pearly Yan <ul style="list-style-type: none">Collaborate with biologists to identify novel cancer-related characteristics in human genes and epigeneticsDevelop software with Python and R to design computational workflows for high-throughput sequencing dataDesign web applications for bioinformatics tools using Python, PHP, JavaScript, HTML and CSSBuild workflows to run on nodes of the Ohio Supercomputer Center to analyze terabyte-order datasets	(Jan 2015 – Apr 2018)

PUBLICATIONS (with proceedings)

* - equal contribution

Killian JA, Perrault A, Tambe M. “Beyond “To Act or Not to Act”: Fast Lagrangian Approaches to General Multi-Action Restless Bandits.” *20th International Conference on Autonomous Agents and Multiagent Systems (AAMAS)*. 2021.

Mate A*, **Killian JA***, Xu H, Perrault A, Tambe M. “Collapsing Bandits and Their Application to Public Health Interventions” *Neural Information Processing Systems (NeurIPS)*. 2020.
<https://papers.nips.cc/paper/2020/hash/b460cf6b09878b00a3e1ad4c72344ccd-Abstract.html>

Wilder B, Charpignon M, **Killian JA**, Ou HC, Mate A, Jabbari S, et al. “Modeling between-population variation in COVID-19 dynamics in Hubei, Lombardy, and New York City” *Proceedings of the National Academy of Sciences (PNAS)*. 2020. <https://doi.org/10.1073/pnas.2010651117>

Killian JA, Wilder B, Sharma A, Choudhary V, Dilkina B, Tambe M. “Learning to Prescribe Interventions for Tuberculosis Patients using Digital Adherence Data” *Proceedings of the 25th ACM SIGKDD International Conference on Knowledge Discovery & Data Mining (KDD)*. ACM, 2019.
<https://doi.org/10.1145/3292500.3330777>

Killian JA, Passino K, Nandi A, Madden D, Clapp J. “Learning to Detect Heavy Drinking Episodes Using Smartphone Accelerometer Data” *Proceedings of the 4th International Workshop on Knowledge Discovery in Healthcare Data (KDH)*. 2019. <http://ceur-ws.org/Vol-2429/paper6.pdf>

Killian JA, Topiwala T, Pelletier A, Frankhouser D, Yan P, Bundschuh R. “FuSpot: A Web-based Tool for Visual Evaluation of Fusion Candidates” *BMC Genomics*. 2018. 19:139. <https://doi.org/10.1186/s12864-018-4486-3>

He H, Li W, Yan P, Bundschuh R, **Killian J**, Labanowska J, et al. “Identification of a recurrent LMO7-BRAF fusion in papillary thyroid carcinoma” *Thyroid*. 2018. <https://doi.org/10.1089/thy.2017.0258>

PREPRINTS

Mate A, **Killian JA**, Wilder B, et al. “Evaluating COVID-19 Lockdown Policies For India: A Preliminary Modeling Assessment for Individual States.” Available at SSRN 3575207. 2020.
https://papers.ssrn.com/sol3/papers.cfm?abstract_id=3575207

WORKSHOP PAPERS/DOCTORAL CONSORTIA (without proceedings)

Killian JA, Perrault A, Tambe M. “Fast Intervention Scheduling via Lagrangian Solutions to Multi-Action Restless Bandits.” AAAI-21 Workshop on AI for Behavior Change, AAAI-21 Workshop on Designing AI for Telehealth. 2021, IJCAI-20 Workshop on AI for Social Good

Prins A, Mate M, **Killian JA**, Abebe R, Tambe M. “Incorporating Healthcare Motivated Constraints in Restless Multi-Armed Bandit Based Resource Allocation” NeurIPS-20 Workshop on Machine Learning for Health. NeurIPS-20 Workshop on Machine Learning in Public Health.

- Awarded: **Best on Theme, Best Lightning Paper**

Sharma A, **Killian JA**, Perrault A. “Optimization of the Low-Carbon Energy Transition Under Static and Adaptive Carbon Taxes via Markov Decision Processes” Harvard CRCS Workshop on AI for Social Good. 2020.

Killian JA, Charpignon M, Wilder B, Perrault A, Tambe M, Majumder MS. “Evaluating COVID-19 Lockdown and Reopening Scenarios for Georgia, Florida, and Mississippi.” KDD-20 Workshop on Humanitarian Mapping. 2020.

WORKSHOP PAPERS/DOCTORAL CONSORTIA (without proceedings, continued)

Mate A*, **Killian JA***, Xu H, Perrault A, Tambe M. “Collapsing Bandits and Their Application to Public Health Interventions.” Doctoral Consortium on Computational Sustainability. 2020

Killian JA, Wilder B, Sharma A, Choudhary V, Dilkina B, Tambe M. “Learning to Prescribe Interventions for Tuberculosis Patients using Digital Adherence Data.” AAMAS-19 Joint Workshop on Autonomous Agents for Social Good. 2019.

ACCEPTED TALKS

- “Fast Lagrangian Approaches to General Multi-Action Restless Bandits”
 - **IJCAI 2020 Workshop on AI for Social Good** (Jan 2021)
- “Personalized Adherence Management in TB: Using AI to Schedule Targeted Interventions”
 - **51st Union World Conference on Lung Health** (Oct 2020)
- “Collapsing Bandits and Their Application to Public Health Interventions”
 - **Doctoral Consortium on Computational Sustainability** (Oct 2020)
- “Evaluating COVID-19 Lockdown and Business-Sector-Specific Reopening Policies for Three US States”
 - **KDD Workshop on Humanitarian Mapping 2020** (Aug 2020)
- “Learning to Prescribe Interventions for Tuberculosis Patients using Digital Adherence Data”
 - **KDD 2019** (Aug 2019)
 - **AAMAS AASG Workshop 2019** (May 2019)
- “Learning to Detect Heavy Drinking Episodes Using Smartphone Accelerometer Data”
 - **IJCAI KDH Workshop 2019** (Aug 2019)

POSTER PRESENTATIONS

- “Fast Lagrangian Approaches to General Multi-Action Restless Bandits”
 - **IJCAI 2020 Workshop on AI for Social Good** (Jan 2021)
- “Collapsing Bandits and Their Application to Public Health Interventions”
 - **NeurIPS 2020** (Dec 2020)
 - **Doctoral Consortium on Computational Sustainability** (Oct 2020)
- “Learning to Prescribe Interventions for Tuberculosis Patients using Digital Adherence Data”
 - **KDD 2019** (Aug 2019)
- “Smartphone-Based Intelligent System: Using AI to Track Sobriety using Smartphone Motion Sensors”
 - **Denman Undergraduate Research Forum (1st Place)** (Apr 2018)
- “FuSpot: A Web-based Tool for Visual Evaluation of Fusion Candidates”
 - **Denman Undergraduate Research Forum** (Mar 2017)
 - **Rustbelt RNA Meeting** (Oct 2016)

INVITED TALKS

- “Predictive Models of Medication Adherence for TB patients in India”
 - **AI vs. TB Workshop**, Mumbai, India (Jul 2019, Jan 2020)
 - **CompuSustNet**, Online (May 2019)
 - **BOTS Robotics Education Program**, LA, CA (Apr 2019)
 - **Goldman Sachs India**, Mumbai, India (Mar 2019)
 - **Wadhvani AI**, Mumbai, India (Mar 2019)
- “FuSpot: A Web-based Tool for Visual Evaluation of Fusion Candidates”
 - **Pelotonia Research Symposium**, Columbus, OH (Oct 2017)
- “OHI/O: Ohio State’s Hackathon Program”
 - **CIO Tomorrow**, Columbus, OH (Apr 2017)

HONORS AND AWARDS

- **National Science Foundation Graduate Research Fellowship**, USC, Harvard (Apr 2019 – Apr 2022)
- **1st Place in Math, Computation, and Analytics**, Denman Research Forum, OSU (Apr 2018)
- **Arts and Sciences Undergraduate Research Scholarship**, Ohio State University (Nov 2017)
- **Physics Senior Alumni Award**, Top graduating senior, OSU Physics (May 2017)
- **Pelotonia Undergraduate Research Fellowship**, Columbus, OH (May 2016 – May 2017)
- **Member of Phi Beta Kappa**, National Honor Society (Apr 2016)
- **Member of Phi Kappa Phi**, National Honor Society (Oct 2015)
- **Member of Sigma Pi Sigma**, Physics Honor Society (Jan 2015)
- **Dean’s List**, all semesters, Ohio State University Arts and Sciences Honors (Aug 2013 – Dec 2018)

PROFESSIONAL EXPERIENCE

Data Science Intern (May 2018 – Jul 2018)

Spatial.ai, Cincinnati, OH

Managers: Lyden Foust, Will Kiessling

- Collect, clean and segment geo-tagged social media posts from everywhere in the United States
- Design natural language processing pipelines using Python to assess “social scores” for cities using social media
- Create predictive models based on “social scores” and demographic data to estimate success of retail store fronts

Application Developer Intern

(May 2017 – Aug 2017)

PNC, Philadelphia, PA

Manager: James Snyder

- Work on software team to develop two ASP.NET web applications to support business operations
- Maintain Python/Django web application, retrofit with SSL certification to comply with security standards
- Design SQL Server Databases and Reports to support web applications

Independent Database Designer

(Jun 2015 – present)

Delaware City Bus Company, Sewell, NJ

Clients: Greg and Isabel Fath

- Design MS Access database for private bus company with 150 bus routes, 80 buses, and 600 employees/students
- Implement functionality to generate schedules for drivers and aides and auto-create all company and state reports
- Construct custom back-end using SQL and VBA to provide a tailored, seamless UI/UX

LEADERSHIP AND TEACHING-RELATED EXPERIENCE

- **Organizer**, AI for Society Rising Stars Workshop (March 2020)
 - Solicit and arrange reviews for 170 submissions
 - Organize 2 days of talks, posters, networking, mentoring for 60 attendees
 - Invite, coordinate 5 keynote talks and expert panels

LEADERSHIP AND TEACHING-RELATED EXPERIENCE (continued)

- **Volunteer**, BOTS robotics education program for elementary students (Jan 2019 – May 2019)
 - Teach groups of 5-6 students basics of block programming
 - Lead professional development programming sessions for teachers
- **Teaching Assistant**, CSCI 102 - Fundamentals of Computation, *USC* (Aug 2018 – Dec 2018)
 - Deliver labs and course material reviews to section of 15 students
 - Create, manage, and grade 12 programming assignments for 200+ students
 - Manage team of 15 graders for 12 assignments, 2 exams, 200+ students
- **Creator, Organizer of ShowOHI/O**, a science-fair-style tech showcase (Apr 2017, Apr 2018)
 - 20 student projects, 60+ professional attendees, 100+ student attendees
 - Led team of 4 to secure venue, funding, projects, attendees, marketing
- **Organizer of DataFest** at Ohio State, a nation-wide data analytics competition (Apr 2017)
 - Organized sponsorship, marketing, team formation; mentored 150+ students
- **Web-team lead, Organizer of HackOHI/O**, Ohio State's hackathon program (Nov 2016, Oct 2017)
 - 750+ students, 200+ professional judges + mentors, 100+ industry partners
 - Organized sponsorship, marketing, team formation, branding; mentor at event
 - Led team of 6 developers to build web site, track site analytics
- **Project lead for data analysis contract** with Columbus Collaboratory (Apr 2016)
 - Led team of 4 to send survey nation-wide, perform text analysis on results

MEDIA

- **Article:** Aria Bendix. "**Four Days of Work, Followed by 10 Days of Lockdown Could Help Prevent Another Wave of Infections.**" *Business Insider France*, May 25, 2020.
 - <https://www.weizmann-usa.org/news-media/in-the-news/four-days-of-work-followed-by-10-days-of-lockdown-could-help-prevent-another-wave-of-infections/>
- **Article:** Leah Burrows. "**What is the Right Strategy to Limit the Spread of COVID-19?**" *Medical Xpress*, May 4, 2020.
 - <https://medicalxpress.com/news/2020-05-strategy-limit-covid-.html>
- **Video Interview:** "**Models for the Spread of COVID-19.**" *Live interview on ABC-7 WJLA*, April 30, 2020.
 - <https://youtu.be/PzDeb6MDVDg>
- **Article:** Amanda Mull. "**Georgia's Experiment in Human Sacrifice.**" *The Atlantic*, April 29, 2020.
 - <https://www.theatlantic.com/health/archive/2020/04/why-georgia-reopening-coronavirus-pandemic/610882/>
- **Article:** William Bredderman and Olivia Messer. "**New Model Shows How Deadly Lifting Georgia's Lockdown May Be.**" *Daily Beast*, April 28, 2020.
 - <https://www.thedailybeast.com/ending-coronavirus-lockdowns-in-mississippi-georgia-and-florida-could-doom-thousands>
- **Article:** Subhra Priyadarshini. "**Model Finds 'Middle Ground' for India's Lockdown Exit.**" *Nature India*, April 27, 2020.
 - <https://www.natureasia.com/en/nindia/article/10.1038/nindia.2020.73>
- **Article:** Pelotonia. "**Pelotonia Investment Report (2017).**" *The James Ohio State University Comprehensive Cancer Center*, May 2017.
 - <https://killian-34.github.io/pdf/2017%20Pelotonia%20Investment%20Report.PDF>

SKILLS

- **Programming Languages (proficient):** Python, Java, C#
- **Data Science/ML tools:** Sklearn, Numpy, Pandas, Keras, Pytorch, Tensorflow
- **Web-design Experience:** ASP.NET, Python/Django, PHP, JavaScript, HTML, CSS
- **Database-design Experience:** SQL, SQLite, Visual Basic, Microsoft Access
- **Research Programming Experience:** Python, R, Linux Environments, MATLAB, Android, iOS, Java