

Jayson Boubin

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WORK EXPERIENCE

Assistant Professor <i>Binghamton University Department of Computer Science</i>	2022-Present
Research Contractor <i>Air Force Research Lab, AutoWav Project</i>	2019-2022
PhD Student and Research Fellow <i>ReRoutLab, Ohio State University</i>	2017-2022
Research Fellow <i>Air Force Institute of Technology</i>	2014-2017
Undergraduate Research Assistant <i>PC2 Lab</i>	2013-2014

EDUCATION

PhD in Computer Science <i>The Ohio State University</i> <i>Thesis: Design, Implementation, and Applications of Fully Autonomous Aerial Systems</i>	2017-2022
M.S. in Computer Science <i>The Ohio State University</i>	2020
B.S. in Computer Science <i>Miami University</i>	2013-2017

RESEARCH FUNDING

- (F1) Real-time Hyperspectral Anomaly Detection with Small Autonomous UAVs
AFRL Mid-Atlantic Hub 2023
\$100,000
PI: **Jayson Boubin**, Co-PIs: Kenneth Chiu, Trevor Bihl, Courtney Wigdahl-Perry

AWARDS AND HONORS

NSF Graduate Research Fellowship (\$150,000) (2019)

Ohio State CSE Graduate Research Award (\$1000) (2022)

Ohio State College of Engineering Graduate Fellowship (2017)

Best Student Paper, Human Performance Modeling Track (\$300),
HFES (2017) (C2)

Best Poster Honorable Mention,
Ohio State CSE Graduate Research Poster Expo (2018) (P6)

KAOC Integrated Product Team Award
AutoWav Project (2019) (P7, C5, C6)

NSF Travel Grants
IEEE ICAC (2017, 2019), IEEE ACSOS (2020), IEEE/ACM SEC (2019)

JOURNAL PAPERS

- (J3) Anthony Baietto, **Jayson Boubin**, Patrick Farr, Trevor Bihl, Aaron Jones, Christopher Stewart
Lean Neural Networks for Autonomous Radar Waveform Design
Sensors 2022: IF 3.5
- (J2) Ming-Der Yang, **Jayson Boubin (Corresponding)**, Hui-Ping Tsai, Hsin-Huang Tseng, Yu-Chun Hsu, Christopher Stewart
Adaptive Autonomous UAV Scouting for Rice Lodging Assessment Using Edge Computing with Deep Learning EDANet
Computers and Electronics in Agriculture 2020
(Ranked #3 Journal in Agriculture: IF 5.5)
- (J1) Zichen Zhang, **Jayson Boubin**, Christopher Stewart, Sami Khanal
Whole-Field Reinforcement Learning: A Fully Autonomous Aerial Scouting Method for Precision Agriculture
Sensors 2020: IF 3.5

CONFERENCE PAPERS

- (C13) **Jayson Boubin**, Zichen Zhang, John Chumley, Christopher Stewart
Adaptive Deployment for Autonomous Agricultural UAV Swarms
ACM Agsys 2022
- (C12) **Jayson Boubin**, Codi Burley, Peida Han, Bowen Li, Barry Porter, Christopher Stewart
MARbLE: Multi-Agent Reinforcement Learning at the Edge for Digital Agriculture
IEEE/ACM Symposium on Edge Computing (SEC) 2022
(Flagship Edge Computing Conference)
- (C11) Chengyi Qu, **Jayson Boubin**, Durbek Gafurov, Jianfeng Zhou, Noel Aloysius, Henry Nguyen, Prasad Calyam

UAV Swarms in Smart Agriculture: Experience and Opportunities
IEEE International Conference on eScience 2022

- (C10) **Jayson Boubin**, Avishek Banerjee, Jihoon Yun, Haiyang Qi, Yuting Fang, Steve Chang, Rajiv Ramnath, Anish Arora
PROWESS: An Open Testbed for Programmable Wireless Edge Systems
ACM Practice and Experience in Advanced Research Computing (PEARC) 2022

- (C9) Anthony Baietto, **Jayson Boubin**, Patrick Farr, Trevor Bihl
Lean Neural Networks for Real-time Embedded Spectral Notching Waveform Design
IEEE International Symposium on Industrial Electronics (ISIE) 2022

- (C8) Maxwell Taylor, **Jayson Boubin**, Christopher Stewart, Feng Qin, Haicheng Chen
A Study on Software Bugs in Unmanned Aerial Systems
International Conference on Unmanned Aircraft Systems (ICUAS) 2021
(Ranked #10 Outlet for Aerospace)

- (C7) Alwyn Burger, Patrick Urban, **Jayson Boubin**, Gregor Schiele
An Architecture for Solving the Eigenvalue Problem on Embedded FPGAs
International Conference on Architecture of Computing Systems (ARCS) 2020

- (C6) Patrick Farr, Aaron Jones, Trevor Bihl, **Jayson Boubin**, Ashley DeMange
Waveform Design Implemented on Neurmorphic Hardware
IEEE International Radar Conference 2020

- (C5) **Jayson Boubin**, Aaron Jones, Trevor Bihl
NeuroWav: Toward Real-Time Waveform Design for VANETs using Neural Networks
IEEE Vehicular Networking Conference (VNC) 2019

- (C4) **Jayson Boubin**, Naveen T.R Babu, Christopher Stewart, John Chumley, Shiqi Zhang
Managing Edge Resources for Fully Autonomous Aerial Systems
IEEE/ACM Symposium on Edge Computing (SEC) 2019
(Flagship Edge Computing Conference)

- (C3) **Jayson Boubin**, John Chumley, Christopher Stewart, Sami Khanal
Autonomic Computing Challenges in Fully Autonomous Precision Agriculture
IEEE International Conference on Autonomic Computing (ICAC) 2019

- (C2) **Jayson Boubin**, Christina Rusnock, Jason Bindewald
Quantifying Compliance and Reliance Trust Behaviors to Influence Trust in Human-Automation Teams
Human Factors and Ergonomics Society Annual Meeting (HFES) 2017

- (C1) Christina Rusnock, **Jayson Boubin**, Joseph Giametta, Tyler Goodman, Anthony Hillesheim, Sungbin Kim, David Meyer, Michael Watson
The Role of Simulation in Designing Human-Automation Systems
Human Computer Interaction International 2016

PREPRINTS

- (PR1) **Jayson Boubin**, Codi Burley, Peida Han, Bowen Li, Barry Porter, Christopher Stewart
Programming and Deployment of Autonomous Swarms using Multi-Agent Reinforcement Learning
ArXiv 2021 (Early version of (C12) MARbLE, SEC 2022)

PUBLISHED ABSTRACTS

- (A5) Anituddha Rakshit, **Jayson Boubin**
Poster Abstract: Automatic Deployment Right-Sizing Through Hyperparameter Optimization
ACM/IEEE International Conference on Internet of Things Design and Implementation (IoTDI) 2023
- (A4) Kevyn Irizary, Zichen Zhang, Christopher Stewart, **Jayson Boubin**
Scalable distributed microservices for autonomous UAV swarms
ACM/IFIP Middleware 2022
- (A3) **Jayson Boubin**, Zichen Zhang, John Chumley, Christopher Stewart
Data-Parallel Versus Task-Parallel Swarms for Small Unmanned Aerial Systems
Internet of Things Design and Implementation (IoTDI) 2022
- (A2) Bowen Li, Nat Shineman, **Jayson Boubin**, Christopher Stewart
Comparison of Object Detectors for Fully Autonomous Aerial Systems Performance
ACM/SPEC International Conference on Performance Engineering 2021
- (A1) **Jayson Boubin**, Shiqi Zhang, Venkata Mandadapu, Christopher Stewart
Poster Abstract: Characterizing Computational Workloads in UAV Applications
ACM/IEEE International Conference on Internet of Things Design and Implementation (IoTDI) 2018

POSTERS, PRESENTATIONS, AND DEMOS

- (P9) **Jayson Boubin**, Christopher Stewart
Design and Implementation of Fully Autonomous Aerial Swarms
Talk: IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS) 2020 Doctoral Symposium
- (P8) **Jayson Boubin**, Christopher Stewart
SoftwarePilot: Fully Autonomous Aerial Systems made Easier
Half-day Tutorial: IEEE International Conference on Autonomic Computing and Self-Organizing Systems (ACSOS) 2020
- (P7) **Jayson Boubin**, Zichen Zhang, Shiqi Zhang, Christopher Stewart
SoftwarePilot: An Open Source Middleware for Fully Autonomous Aerial Systems
Poster: ACM Student Research Competition, International Symposium on Microarchitecture (MICRO) 2019
- (P6) Aaron M. Jones, Trevor Bihl, Ashley DeMange, Peter John-Baptiste, **Jayson Boubin**, Patrick Farr
AutoWav Project: AI/ML for Cognitive EW
Poster: Association of Old Crows Kittyhawk Week Conference

- (P5) **Jayson Boubin**, Christina Rusnock
Quantifying and Evaluating Trust in Automated Systems
Talk: Industrial and Systems Engineers Research Conference (ISERC) 2016
- (P4) **Jayson Boubin**, Christina Rusnock, Michael Miller
Eliciting an Algorithm to Replicate Human Trust in Automation in the Domain of Reliance
Poster: DESS 2015, Soche Poster expo 2015
- (P3) **Jayson Boubin**, Christina Rusnock, Michael Miller
Simulating Compliance and Reliance
Talk: Cincinnati-Dayton INFORMS 2015
- (P2) **Jayson Boubin**, Christina Rusnock
Modeling Cognitive Workload and Fatigue for Defensive Cybersecurity Operators
Poster: AFIT Summer Intern Poster Session 2014
- (P1) **Jayson Boubin**, Paul Bondurant, D.J. Rao
Dynamic Process Migration in Agent Based Simulation
Poster: Miami University Undergraduate Research Forum 2014

MEDIA

- (M1) AgDay 7/29/22 broadcast
Autonomous UAV Swarms for Soybean Defoliation Scouting
Television News Report

TEACHING

As Faculty

Binghamton University

CSE 350: Operating Systems

Fall '22, Spring '23

As Graduate TA/Instructor of Record

The Ohio State University

CSE 2431: Operating Systems

Spring '19 (Mean Student Evaluation Score: **4.6/5**)

As Undergraduate TA

Miami University

Spring '17 CSE 381 Operating Systems

ADVISING AND MENTORSHIP

PhD Students

Aniruddha Rakshit (2022-Present)

Masters Students

Zain-ul-Abideen Nasir (2023-Present)

Undergraduate Research Assistants

Taylor Bruck (2023-present)
Matthew Szklany (2022-present)
Adam Cohen (2022-present) Luke Smith (2022-present)
Kevyn Angueira (2021-Present)
Anthony Baietto (2019-2022), **CS PhD Student at OSU**
Jack Dubbs (2019-2020), KeyW Corp
Pieda Han (2019-2020), USC
Yujie Zhao (2019-2020)
Sadaqat Ali (2019-2020), Nationwide
Bowen Li (2019-2021), USC
Nat Shineman (2019-2021)
Chengyuan Zhou (2019-2021), Google
Shiqi Zhang (2017-2019), Morgan Stanley

PROFESSIONAL SERVICE

Committee Member:

- TPC Member, IoTDI 2023
- Social Media Chair, IoTDI 2022
- TPC Member, IEEE DASC 2021
- Poster and Demo Program Committee member, IoTDI 2020

Reviewer:

- IEEE Robotics and Automation Letters (2022)
- Journal of Parallel and Distributed Computing (2021)
- IEEE International Conference on Communications (2021)
- PeerJ Computer Science Journal (2021)
- ACM/IEEE International Conference on Cyber-Physical Systems (2022)

Other:

- Cornell Institute for Digital Agriculture Hackathon Mentor (2023)
- OHI/O HackAI Hackathon Judge (2019)
- ACM-W Buck-I-Code Mentor (2018)

SOFTWARE

SoftwarePilot

I am the lead developer of SoftwarePilot, a middleware that supports fully autonomous aerial systems. SoftwarePilot has been cloned hundreds of times, and is used by myself, researchers in the ReRoutLab, and a group of scientists and hobbyists around the world to develop state of the art autonomous systems using cutting edge AI libraries. SoftwarePilot is open source and available on Github: github.com/boubinjjg/SoftwarePilot