Jayson Boubin

Curriculum Vitae

PERSONAL DETAILS

Address	778 Dreese labs, 2015 Neil Avenue, Columbus Ohio, 43210
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Website	jaysonboubin.com
Github	github.com/boubinjg

EDUCATION

PhD in Computer Science 2017-Preset

The Ohio State University

Studying fully autonomous aerial systems under Dr. Chris Stewart

M.S. In Computer Science 2020

The Ohio State University

B.S. in Computer Science 2013-2017

Miami University

WORK EXPERIENCE

PhD Student and Research Fellow 2017-Present

The Ohio State University, ReRout Lab

I am a PhD student in the ReRoutLab at The Ohio State University working on state of the art computer systems and robotics research. I create fully autonomous aerial systems (FAAS); self aware unmanned aerial systems that solve dynamic, real world problems in areas like autonomous photography and agriculture. These FAAS leverage consumer grade hardware and advanced computer vision and deep learning algorithms to accomplish missions with no human supervision. As part of my research, I have developed an open source software package for FAAS, SoftwarePilot, that I maintain on Github.

Research Intern 2019

Air Force Research Lab, AutoWav Project

At AFRL, I created and tuned deep learning models to eliminate interference in radar signals. I worked with new hardware accelerators such as the Intel Loihi to create real time, low power, deep solutions to compete with existing cognitive radio research. I created a new approach that sped up our existing neural network by 8x, and decreased its size by 40x to execute on low-power accelerators.

Research Fellow 2014-2017

Air Force Institute of Technology

As a research fellow at AFIT, I performed research under Maj. Christina Rusnock, PhD and Dr. Michael Miller in areas such as unmanned aerial systems, cybersecurity, applied neuroscience, and autonomy. I conducted my own research into these topics while preparing lecture

materials for graduate level courses, writing academic papers, posters, and presentations, and collaborating with excellent researchers on popular research problems.

Undergraduate Research Assistant 2013-2014
PC2 Lab

I performed research under Dr. Dhananjai Rao focusing on parallel agent based simulation optimization on compute clusters.

AWARDS AND HONORS

NSF Graduate Research Fellowship (2019)

Ohio State College of Engineering Graduate Fellowship (2017)

Best Student Paper, Human Performance Modeling Track,
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 Grant
IEEE ICAC (2017, 2019)

NSF Travel Grant
IEEE ACSOS (2020)

NSF Travel Grant
IEEE/ACM SEC (2019)

JOURNAL PAPERS

(J1) Ming-Der Yang, **Jayson Boubin**, 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

(J2) Zichen Zhang, **Jayson Boubin**, Christopher Stewart, Sami Khanal
Whole-Field Reinforcement Learning: A Fully Autonomous Aerial Scouting Method for Precision Agriculture
Sensors 2020

CONFERENCE PAPERS

(C7) Alwyn Burger, Patrick Urban, **Jayson Boubin**, Gregor Schiele
An Architecture for Solving the Eigenvalue Problem on Embedded FPGAs
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 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 SEC 2019

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

(C2) **Jayson Boubin**, Christina Rusnock, Jason Bindewald
Quantifying Compliance and Reliance Trust Behaviors to Influence Trust in Human-Automation Teams
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
HCI 2016

PUBLISHED ABSTRACTS

(A1) **Jayson Boubin**, Shiqi Zhang, Venkata Mandadapu, Christopher Stewart
Poster Abstract: Characterizing Computational Workloads in UAV Applications
IoTDI 2018

POSTERS, PRESENTATIONS, AND DEMOS

(P10) **Jayson Boubin** Christopher Stewart
Design and Implementation of Fully Autonomous Aerial Swarms
Talk: ACSOS 2020 Doctoral Symposium

(P9) **Jayson Boubin** Christopher Stewart
SoftwarePilot: Fully Autonomous Aerial Systems made Easier
Half-day Tutorial: ACSOS 2020

(P8) **Jayson Boubin**, Zichen Zhang, Shiqi Zhang, Christopher Stewart
SoftwarePilot: An Open Source Middleware for Fully Autonomous Aerial Systems
Poster: ACM Student Research Competition, MICRO 2019

(P7) 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

(P6) **Jayson Boubin**, Shiqi Zhang, Venkata Mandadapu, Christopher Stewart
Characterizing Computation in UAV Applications
Poster: IoTDI 2018, OSU CSE Poster Expo 2018

(P5) **Jayson Boubin**, Christina Rusnock
Quantifying and Evaluating Trust in Automated Systems
Talk: 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

PROFESSIONAL SERVICE

Committee Member: Poster and Demo Program Committee member, IoTDI 2020

Reviewer: Journal of Parallel and Distributed Computing, IEEE International Conference on Communications (2021)

TEACHING

Graduate Teaching Assistant 2019
The Ohio State University

As and GTA, I was the instructor of record for CSE 2431: Systems II: Introduction to Operating Systems. I taught students about fundamental operating systems concepts like processes, threads, synchronization, memory management, I/O, etc, with a focus on Linux. I was responsible for lecturing, managing course materials, holding office hours, and submitting and approving grades.

Mean Student Evaluation Score: **4.6/5**.

Undergraduate Teaching Assistant 2017
Miami University

As an Undergraduate TA at Miami University, I graded assignments and held weekly help sessions for Dr. Jianhui Yue's Systems 2: Operating Systems course.

ADVISING AND MENTORSHIP

Mentored Masters Students

Anthony Baietto (2019-Present)

Undergraduate Research Assistants

Jack Dubbs (2019-2020), KeyW Corp
Pieda Han (2019-2020), USC
Yujie Zhao (2019-2020)
Sadaqat Ali (2019-Present)
Bowen Li (2019-Present)
Nat Shineman (2019-Present)
Chengyuan Zhou (2019-Present)

SOFTWARE

SoftwarePilot

I am the lead developer of SoftwarePilot, a middleware that supports fully autonomous aerial systems. SoftwarePilot is used by myself and researchers in the ReRoutLab to develop state of the art autonomous systems using cutting edge AI libraries. SoftwarePilot is open source and available on Github: *github.com/boubinjg/SoftwarePilot*

SKILLS

Programming (Skilled)	Java, Python, C++
Programming (Comfortable)	C, C#, Matlab, Bash
Operating Systems	Linux
HPC Software	MPI, OpenMP, CUDA
AI Software	Tensorflow, OpenCV, DLIB
UAS Software	DJI SDK, ArduPilot, MAVLink, DroneKit
Version Control	Git, SVN
Editing	Vim, LaTeX
Systems Software	Docker, Kubernetes, Hadoop

REFERENCES

Available upon request