Nicholas Waytowich

Curriculum Vitae

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Professional Experience

2022–Present **Senior Machine Learning Research Scientist**, *Humans and Complex Systems Division, U.S. Army Research Laboratory*, Maryland.
Developing human-guided AI/ML algorithms and LLMs to improve human-autonomy teaming

2017–2022 **Machine Learning Research Scientist**, *Human Research and Engineering Directorate (HRED), U.S. Army Research Laboratory*, Maryland.
Researching machine learning, human-agent teaming, multi-agent systems and deep-reinforcement learning.

2019–2020 **CEO and Co-Founder**, *AIMS-Technologies, LLC*.
CEO and co-founder of a start-up company (Aerial Interception of Multirotor Systems (AIMS) Technologies) to research and develop new capabilities to detect and counter non-cooperative, small unmanned aerial systems (sUAS)

2017–2020 **Adjunct Associate Research Scientist**, *Columbia University*, New York.
Researching novel AI/ML methods for Brain-Computer Interfaces

2015–2017 **Postdoctoral Research Fellow**, *Laboratory for Intelligent Imaging and Neural Computing (LIINC), Columbia University*, New York.
Researched the neural correlates of adaptation during longitudinal feedback from brain-computer interfaces and designing novel transfer learning algorithms for real-world neuro-imaging paradigms.

2015–2017 **Postdoctoral Research Fellow**, *Human Research and Engineering Directorate (HRED), U.S. Army Research Laboratory*, Maryland.
Focused on the design and implementation of heterogeneous, multi-agent systems of human and computer agents for collaborative machine learning.

2010–2015 **Graduate Research Assistant**, *Advanced Signal Processing in Engineering and Neuroscience Lab - ODU*, Norfolk.
Developed novel signal processing and machine learning algorithms for non-invasive and visual based brain-computer interfaces to aid individuals with severe neuromuscular disorders.

2008–2010 **Research Assistant**, *Brain-Computer Interface Lab, University of North Florida*, Jacksonville.
Developed novel brain-computer interface applications to control anthropomorphic manipulator arms for neuroprosthetic control.

Teaching and Mentoring Experience

2024–Present **Adjunct Professor**, *University of Maryland Baltimore County (UMBC)*, Maryland.
Teaching CMSC-478 Introduction to Machine Learning

2023–Present **Adjunct Professor**, *Anne Arundel Community College (AACC)*, Maryland.
Teaching EGR-120 (Intro to Engineering) and EGR-250 (Intermediate Programming) courses

2018–Present **ORAU Student Mentor/Advisor**, *Army Research Laboratory*.
Currently mentor several undergraduate, and graduate students each year through OakRidge Associated Universities (ORAU) on various projects related to machine learning, reinforcement learning, robotics and human-in-the-loop AI

2008–2010 **Laboratory Instructor**, *Robotics Laboratory, University of North Florida*.
Managed UNF's Robotics and Manufacturing laboratory and taught the Robotics lab for the Introduction to Robotics course at UNF. Responsibilities included the development, preparation and teaching of weekly lectures and laboratory exercises

Education

2013-2015 **Ph.D. Biomedical Engineering**, *Old Dominion University, Norfolk VA*.
Specialization in Brain-Computer Interfaces and Machine Learning

2011–2013 **Masters in Electrical and Computer Engineering,**, *Old Dominion University, VA*.
Specialization in Signal Processing and Machine Learning

2006–2010 **B.S. Mechanical Engineering**, *University of North Florida, Jacksonville FL*.
Specialization in Robotics

Research and Teaching Interests

- Human-Guided Machine Learning
- Human-in-the-loop Reinforcement Learning
- Brain-Computer Interfaces
- Human-Agent Teaming
- Machine Learning & Artificial Intelligence
- Large-Language Models
- Robotics
- Reinforcement Learning

Publications

2025 Mingyang Mao and Mariela M Perez-Cabarcas and Utteja Kallakuri and **Nicholas R Waytowich** and Xiaomin Lin and Tinoosh Mohsenin. *Multi-RAG: A Multimodal Retrieval-Augmented Generation System for Adaptive Video Understanding*. 2025

Mingkang Wu and Devin White and Vernon Lawhern and **Nicholas R Waytowich** and Yongcan Cao. *Rbrl2. 0: Integrated reward and policy learning for rating-based reinforcement learning*. 2025

Jonathan Hyun and **Nicholas R Waytowich** and Boyuan Chen. *CREW-WILDFIRE: Benchmarking Agentic Multi-Agent Collaborations at Scale*. 2025

Mikolaj Walczak and Romina Aalishah and Wyatt Mackey and Brittany Story and David L Boothe Jr and **Nicholas Waytowich** and Xiaomin Lin and Tinoosh Mohsenin. *EDEN: Entorhinal Driven Egocentric Navigation Toward Robotic Deployment*. 2025

Evelyn Rose and Devin White and Mingkang Wu and Vernon Lawhern and **Nicholas R Waytowich** and Yongcan Cao. *Performance optimization of ratings-based reinforcement learning*. 2025

Indrajeet Ghosh and Kasthuri Jayarajah and **Nicholas Waytowich** and Nirmalya Roy. *Augmenting Personalized Memory via Practical Multimodal Wearable Sensing in Visual Search and Wayfinding Navigation*. 2025

Mingkang Wu and Devin White and Evelyn Rose and Vernon Lawhern and **Nicholas R Waytowich** and Yongcan Cao. *Multi-Task Reward Learning from Human Ratings*. 2025

Indrajeet Ghosh and Kasthuri Jayarajah and **Nicholas Waytowich** and Nirmalya Roy. *Memento: Augmenting Personalized Memory via Practical Multimodal Wearable Sensing in Visual Search and Wayfinding Navigation*. 2025

Anna Madison and Kaleb McDowell and Vinicius G Goecks and Jeff Hansberger and Ceili M Olney and Claire Ahern and Amar Marathe and **Nicholas Waytowich** and Christian Kenney and Christopher Kelshaw. *" New" Challenges for Future C2: Commanding Soldier-Machine Partnerships*. 2025

2024 Vinicius G Goecks and **Nicholas Waytowich**. *Coa-gpt: Generative pre-trained transformers for accelerated course of action development in military operations*. 2024

Devin White and Mingkang Wu and Ellen Novoseller and Vernon J Lawhern and **Nicholas Waytowich** and Yongcan Cao. *Rating-based reinforcement learning*. 2024

Lingyu Zhang and Zhengran Ji and **Nicholas Waytowich** and Boyuan Chen. *GUIDE: Real-time human-shaped agents*. 2024

Nicholas R Waytowich and Devin White and MD Sunbeam and Vinicius G Goecks. *Atari-gpt: Investigating the capabilities of multimodal large language models as low-level policies for atari games*. 2024

Anna Madison and Ellen Novoseller and Vinicius G Goecks and Benjamin T Files and **Nicholas Waytowich** and Alfred Yu and Vernon J Lawhern and Steven Thurman and Christopher Kelshaw and Kaleb McDowell. *Scalable interactive machine learning for future command and control*. 2024

Utteja Kallakuri and Bharat Prakash and Arnab Neelim Mazumder and Hasib-Al Rashid and **Nicholas R Waytowich** and Tinoosh Mohsenin. *Atlas: Adaptive landmark acquisition using llm-guided navigation*. 2024

Ahaan Dabholkar and James Z Hare and Mark Mittrick and John Richardson and **Nicholas Waytowich** and Priya Narayanan and Saurabh Bagchi. *Adversarial attacks on reinforcement learning agents for command and control*. 2024

Nicholas R Waytowich and Devin White and MD Sunbeam and Vinicius G Goecks. *Atari-GPT: Benchmarking Multimodal Large Language Models as Low-Level Policies in Atari Games*. 2024

Mark Mittrick and John Richardson and Vinicius G Goecks and James Zachary Hare and **Nicholas Waytowich**. *Investigating the mission impact of non-kinetic variables in the operational environment*. 2024

2023 Vinicius G Goecks and **Nicholas R Waytowich**. *Disasterresponsegpt: Large language models for accelerated plan of action development in disaster response scenarios*. 2023

Vinicius G Goecks and **Nicholas Waytowich** and Derrik E Asher and Song Jun Park and Mark Mittrick and John Richardson and Manuel Vindiola and Anne Logie and Mark Dennison and Theron Trout and Priya Narayanan and Alexander Kott. *On games and simulators as a platform for development of artificial intelligence for command and control*. 2023

Stephanie Milani and Anssi Kanervisto and Karolis Ramanauskas and Sander Schulhoff and Brandon Houghton and Sharada Mohanty and Byron Galbraith and Ke Chen and Yan Song and Tianze Zhou and Bingquan Yu and He Liu and Kai Guan and Yujing Hu and Tangjie Lv and Federico Malato and Florian Leopold and Amogh Raut and Ville HautamÃďki and Andrew Melnik and Shu Ishida and JoÃčo F Henriques and Robert Klassert and Walter Laurito and Ellen Novoseller and Vinicius G Goecks and **Nicholas Waytowich** and David Watkins and Josh Miller and Rohin Shah. *Towards solving fuzzy tasks with human feedback: A retrospective of the minerl basalt 2022 competition*. 2023

Sean Kulinski and **Nicholas R Waytowich** and James Z Hare and David I Inouye. *Starcraftimage: A dataset for prototyping spatial reasoning methods for multi-agent environments*. 2023

Ellen Novoseller and Vinicius G Goecks and David Watkins and Josh Miller and **Nicholas Waytowich**. *DIP-RL: Demonstration-Inferred Preference Learning in Minecraft*. 2023

Prashant Ganesh and J Humberto Ramos and Vinicius G Goecks and Jared Paquet and Matthew Longmire and **Nicholas R Waytowich** and Kevin Brink. *Learning Flight Control Systems from Human Demonstrations and Real-Time Uncertainty-Informed InterventionsâŃĘ*. 2023

2022 Mozhgan Navardi and Aidin Shiri and Edward Humes and **Nicholas R Waytowich** and Tinoosh Mohsenin. *An optimization framework for efficient vision-based autonomous drone navigation*. 2022

Mozhgan Navardi and Prakhar Dixit and Tejaswini Manjunath and **Nicholas R Waytowich** and Tinoosh Mohsenin and Tim Oates. *Toward real-world implementation of deep reinforcement learning for vision-based autonomous drone navigation with mission*. 2022

Rohin Shah and Steven H Wang and Cody Wild and Stephanie Milani and Anssi Kanervisto and Vinicius G Goecks and **Nicholas Waytowich** and David Watkins-Valls and Bharat Prakash and Edmund Mills and Divyansh Garg and Alexander Fries and Alexandra Souly and Jun Shern Chan and Daniel del Castillo and Tom Lieberum. *Retrospective on the 2021 minerl BASALT competition on learning from human feedback*. 2022

Brian CÃľsar-Tondreau and Garrett Warnell and Kevin Kochersberger and **Nicholas R Waytowich**. *Towards fully autonomous negative obstacle traversal via imitation learning based control*. 2022

David Watkins-Valls and Peter K Allen and Henrique Maia and Madhavan Seshadri and Jonathan Sanabria and **Nicholas Waytowich** and Jacob Varley. *Mobile manipulation leveraging multiple views*. 2022

Aidin Shiri and Mozhgan Navardi and Tejaswini Manjunath and **Nicholas R Waytowich** and Tinoosh Mohsenin. *Efficient language-guided reinforcement learning for resource-constrained autonomous systems*. 2022

Aidin Shiri and Uttej Kallakuri and Hasib-Al Rashid and Bharat Prakash and **Nicholas R Waytowich** and Tim Oates and Tinoosh Mohsenin. *E2hrl: An energy-efficient hardware accelerator for hierarchical deep reinforcement learning*. 2022

Anjon Basak and Erin G Zaroukian and Kevin Corder and Rolando Fernandez and Christopher D Hsu and Piyush K Sharma and **Nicholas R Waytowich** and Derrik E Asher. *Utility of doctrine with multi-agent RL for military engagements*. 2022

Bharat Prakash and **Nicholas Waytowich** and Tim Oates and Tinoosh Mohsenin. *Towards an interpretable hierarchical agent framework using semantic goals*. 2022

Indrajeet Ghosh and Avijoy Chakma and Sreenivasan Ramasamy Ramamurthy and Nirmalya Roy and **Nicholas Waytowich**. *Permtl: A multi-task learning framework for skilled human performance assessment*. 2022

Rohin Shah and Steven H Wang and Cody Wild and Stephanie Milani and Anssi Kanervisto and Vinicius G Goecks and **Nicholas Waytowich** and David Watkins-Valls and Bharat Prakash and Edmund Mills and Divyansh Garg and Alexander Fries and Alexandra Souly and Chan Jun Shern and Daniel del Castillo and Tom Lieberum. *Retrospective on the 2021 BASALT competition on learning from human feedback*. 2022

Nicholas Waytowich and James Hare and Vinicius G Goecks and Mark Mittrick and John Richardson and Anjon Basak and Derrik E Asher. *Learning to guide multiple heterogeneous actors from a single human demonstration via automatic curriculum learning in StarCraft II*. 2022

Bharat Prakash and **Nicholas R Waytowich** and Tim Oates and Tinoosh Mohsenin. *Hierarchical Agents by Combining Language Generation and Semantic Goal Directed RL*. 2022

David Watkins and Peter Allen and Krzysztof Choromanski and Jacob Varley and **Nicholas Waytowich**. *Multiple View Performers for Shape Completion*. 2022

Mohit Khatwani and Hasib-Al Rashid and Hirenkumar Paneliya and Mark Horton and Houman Homayoun and **Nicholas Waytowich** and W David Hairston and Tinoosh Mohsenin. *A flexible software-hardware framework for brain eeg multiple artifact identification*. 2022

Kasthuri Jayarajah and Aryya Gangopadhyay and **Nicholas Waytowich**. *TagTeam Towards wearable-assisted, implicit guidance for human-drone teams*. 2022

Nicholas R Waytowich and Tim Oates and Tinoosh Mohsenin. *E2HRL: An Energy-Eficient Hardware Accelerator for Hierarchical Deep Reinforcement Learning*. 2022

2021 Mohit Khatwani and Hasib-Al Rashid and Hirenkumar Paneliya and Mark Horton and **Nicholas Waytowich** and W David Hairston and Tinoosh Mohsenin. *A flexible multichannel EEG artifact identification processor using depthwise-separable convolutional neural networks*. 2021

Brian CÃĺsar-Tondreau and Garrett Warnell and Ethan Stump and Kevin Kochersberger and **Nicholas R Waytowich**. *Improving autonomous robotic navigation using imitation learning*. 2021

Nitheesh Kumar Manjunath and Aidin Shiri and Morteza Hosseini and Bharat Prakash and **Nicholas R Waytowich** and Tinoosh Mohsenin. *An energy efficient edgeai autoencoder accelerator for reinforcement learning*. 2021

Kristin E Schaefer and Brandon Perelman and Joe Rexwinkle and Jonroy Canady and Catherine Neubauer and **Nicholas Waytowich** and Gabriella Larkin and Katherine Cox and Michael Geuss and Gregory Gremillion and Jason S Metcalfe and Arwen DeCostanza and Amar Marathe. *Human-autonomy teaming for the tactical edge: The importance of humans in artificial intelligence research and development*. 2021

Vinicius G Goecks and **Nicholas Waytowich** and David Watkins-Valls and Bharat Prakash. *Combining learning from human feedback and knowledge engineering to solve hierarchical tasks in minecraft*. 2021

Bharat Prakash and **Nicholas Waytowich** and Tim Oates and Tinoosh Mohsenin. *Interactive hierarchical guidance using language*. 2021

Aidin Shiri and Arnab Neelim Mazumder and Bharat Prakash and Houman Homayoun and **Nicholas R Waytowich** and Tinoosh Mohsenin. *A hardware accelerator for language-guided reinforcement learning*. 2021

Aidin Shiri and Bharat Prakash and Arnab Neelim Mazumder and **Nicholas R Waytowich** and Tim Oates and Tinoosh Mohsenin. *An energy-efficient hardware accelerator for hierarchical deep reinforcement learning*. 2021

Ravi Kumar Thakur and MD Sunbeam and Vinicius G Goecks and Ellen Novoseller and Ritwik Bera and Vernon J Lawhern and Gregory M Gremillion and John Valasek and **Nicholas R Waytowich**. *Imitation learning with human eye gaze via multi-objective prediction*. 2021

Ritwik Bera and Vinicius G Goecks and Gregory M Gremillion and Vernon J Lawhern and John Valasek and **Nicholas R Waytowich**. *Gaze-Informed Multi-Objective Imitation Learning from Human Demonstrations*. 2021

Bharat Prakash and **Nicholas Waytowich** and Tinoosh Mohsenin and Tim Oates. *Automatic goal generation using dynamical distance learning*. 2021

2020 Bharat Prakash and **Nicholas R Waytowich** and Ashwinkumar Ganesan and Tim Oates and Tinoosh Mohsenin. *Guiding Safe Reinforcement Learning Policies Using Structured Language Constraints.*. 2020

David Watkins-Valls and Jingxi Xu and **Nicholas Waytowich** and Peter Allen. *Learning your way without map or compass: Panoramic target driven visual navigation*. 2020

Aidin Shiri and Arnab Neelim Mazumder and Bharat Prakash and Nitheesh Kumar Manjunath and Houman Homayoun and Avesta Sasan and **Nicholas R Waytowich** and Tinoosh Mohsenin. *Energy-efficient hardware for language guided reinforcement learning*. 2020

Addison W Bohannon and Vernon J Lawhern and **Nicholas R Waytowich** and Radu V Balan. *The autoregressive linear mixture model: A time-series model for an instantaneous mixture of network processes*. 2020

Divya Ramesh and Anthony Z Liu and Andres J Echeverria and Jean Y Song and **Nicholas R Waytowich** and Walter S Lasecki. *Yesterday's reward is today's punishment: Contrast effects in human feedback to reinforcement learning agents*. 2020

2019 Vinicius G Goecks and Gregory M Gremillion and Vernon J Lawhern and John Valasek and **Nicholas R Waytowich**. *Integrating behavior cloning and reinforcement learning for improved performance in dense and sparse reward environments*. 2019

Vinicius G Goecks and Gregory M Gremillion and Vernon J Lawhern and John Valasek and **Nicholas R Waytowich**. *Efficiently combining human demonstrations and interventions for safe training of autonomous systems in real-time*. 2019

Bharat Prakash and Mohit Khatwani and **Nicholas R Waytowich** and Tinoosh Mohsenin. *Improving Safety in Reinforcement Learning Using Model-Based Architectures and Human Intervention.*. 2019

Bharat Prakash and Mark Horton and **Nicholas R Waytowich** and William David Hairston and Tim Oates and Tinoosh Mohsenin. *On the use of deep autoencoders for efficient embedded reinforcement learning*. 2019

Nicholas Waytowich and Sean L Barton and Vernon Lawhern and Garrett Warnell. *A narration-based reward shaping approach using grounded natural language commands*. 2019

Nicholas Waytowich and Sean L Barton and Vernon Lawhern and Ethan Stump and Garrett Warnell. *Grounding natural language commands to StarCraft II game states for narration-guided reinforcement learning*. 2019

Derrik Asher and Michael Garber-Barron and Sebastian Rodriguez and Erin Zaroukian and **Nicholas Waytowich**. *Multi-agent coordination profiles through state space perturbations*. 2019

Mohit Khatwani and W David Hairston and **Nicholas Waytowich** and Tinoosh Mohsenin. *A low complexity automated multi-channel EEG artifact detection using EEGNet*. 2019

Erin Zaroukian and Sebastian S Rodriguez and Sean L Barton and James A Schaffer and Brandon Perelman and **Nicholas R Waytowich** and Blaine Hoffman and Derrik E Asher. *Algorithmically identifying strategies in multi-agent game-theoretic environments*. 2019

DE Asher and SL Barton and E Zaroukian and **NR Waytowich**. *Effect of cooperative team size on coordination in adaptive multi-agent systems*. 2019

Sean L Barton and Erin Zaroukian and Derrik E Asher and **Nicholas R Waytowich**. *Evaluating the coordination of agents in multi-agent reinforcement learning*. 2019

Pietro Pierpaoli and Harish Ravichandar and **Nicholas Waytowich** and Anqi Li and Derrik Asher and Magnus Egerstedt. *Inferring and learning multi-robot policies by observing an expert*. 2019

Ritwik Bera and Vinicius G Goecks and Gregory M Gremillion and John Valasek and **Nicholas R Waytowich**. *Podnet: A neural network for discovery of plannable options*. 2019

Pawan Lapborisuth and Josef Faller and Jonathan Koss and **Nicholas R Waytowich** and Jonathan Touryan and Paul Sajda. *Investigating evoked EEG responses to targets presented in virtual reality*. 2019

Sunil Gandhi and Tim Oates and Tinoosh Mohsenin and **Nicholas R Waytowich**. *Learning behaviors from a single video demonstration using human feedback*. 2019

Yilun Zhou and Derrik E Asher and **Nicholas R Waytowich** and Julie A Shah. *On memory mechanism in multi-agent reinforcement learning*. 2019

Sunil Gandhi and Tim Oates and Tinoosh Mohsenin and **Nicholas Waytowich**. *Learning from observations using a single video demonstration and human feedback*. 2019

2018 Vernon J Lawhern and Amelia J Solon and **Nicholas R Waytowich** and Stephen M Gordon and Chou P Hung and Brent J Lance. *EEGNet: a compact convolutional neural network for EEG-based brainâĂŞcomputer interfaces*. 2018

Garrett Warnell and **Nicholas Waytowich** and Vernon Lawhern and Peter Stone. *Deep tamer: Interactive agent shaping in high-dimensional state spaces*. 2018

Nicholas Waytowich and Vernon J Lawhern and Javier O Garcia and Jennifer Cummings and Josef Faller and Paul Sajda and Jean M Vettel. *Compact convolutional neural networks for classification of asynchronous steady-state visual evoked potentials*. 2018

Mohit Khatwani and Morteza Hosseini and Hirenkumar Paneliya and Tinoosh Mohsenin and W David Hairston and **Nicholas Waytowich**. *Energy efficient convolutional neural networks for eeg artifact detection*. 2018

Sean L Barton and **Nicholas R Waytowich** and Erin Zaroukian and Derrik E Asher. *Measuring collaborative emergent behavior in multi-agent reinforcement learning*. 2018

Nicholas R Waytowich and Vinicius G Goecks and Vernon J Lawhern. *Cycle-of-learning for autonomous systems from human interaction*. 2018

Sean L Barton and **Nicholas R Waytowich** and Derrik E Asher. *Coordination-driven learning in multi-agent problem spaces*. 2018

Josef Faller and Neil Weiss and **Nicholas Waytowich** and Paul Sajda. *BrainâĂŞComputer Interfaces for Mediating Interaction in Virtual and Augmented Reality*. 2018

Vernon J Lawhern and Amelia J Solon and **Nicholas R Waytowich** and Stephen M Gordon and Chou P Hung and Brent J Lance. *EEGNet: a compact convolutional neural network*. 2018

Nicholas R Waytowich and Erin ZaroukianÂź. *Measuring Collaborative Emergent Behavior in Multi-agent Reinforcement Learning*. 2018

2017 **Nicholas R Waytowich** and Dean J Krusienski. *Development of an extensible SSVEP-BCI software platform and application to wheelchair control*. 2017

Vernon J Lawhern and Amelia J Solon and **Nicholas R Waytowich**. *Review on EEG-BCI classification techniques advancements*

2016 Haiqiang Wang and Yu Zhang and **Nicholas R Waytowich** and Dean J Krusienski and Guoxu Zhou and Jing Jin and Xingyu Wang and Andrzej Cichocki. *Discriminative feature extraction via multivariate linear regression for SSVEP-based BCI*. 2016

Nicholas R Waytowich and Vernon J Lawhern and Addison W Bohannon and Kenneth R Ball and Brent J Lance. *Spectral transfer learning using information geometry for a user-independent brain-computer interface*. 2016

Nicholas R Waytowich and Josef Faller and Javier O Garcia and Jean M Vettel and Paul Sajda. *Unsupervised adaptive transfer learning for steady-state visual evoked potential brain-computer interfaces*. 2016

Nicholas R Waytowich and Yusuke Yamani and Dean J Krusienski. *Optimization of checkerboard spatial frequencies for steady-state visual evoked potential brainâĂŞcomputer interfaces*. 2016

Sameer Saproo and Josef Faller and Victor Shih and Paul Sajda and **Nicholas R Waytowich** and Addison Bohannon and Vernon J Lawhern and Brent J Lance and David Jangraw. *Cortically coupled computing: A new paradigm for synergistic human-machine interaction*. 2016

Nicholas R Waytowich and Dean J Krusienski. *Multiclass steady-state visual evoked potential frequency evaluation using chirp-modulated stimuli*. 2016

Addison W Bohannon and **Nicholas R Waytowich** and Vernon J Lawhern and Brian M Sadler and Brent J Lance. *Collaborative image triage with humans and computer vision*. 2016

2015 MM Rashid and MH Kabir and MM Hossain and MR Bhuiyan and MA Iqbal Khan. *Eco-friendly management of chilli anthracnose (Colletotrichum capsici).*. 2015

Nicholas Waytowich and Dean Krusienski. *Spatial decoupling of targets and flashing stimuli for visual brainâĂŞcomputer interfaces*. 2015

Nicholas R Waytowich. *Development of a practical visual-evoked potential-based brain-computer interface*. 2015

2014 **Nicholas Waytowich** and Dean Krusienski. *Novel Characterization of the Steady-State Visual Evoked Potential Spectrum of EEG*. 2014

2011 Garett Johnson and **Nicholas Waytowich** and Dean J Krusienski. *The challenges of using scalp-EEG input signals for continuous device control*. 2011

2010 **Nicholas Waytowich** and Andrew Henderson and Dean Krusienski and Daniel Cox. *Robot application of a brain computer interface to staubli tx40 robots-early stages*. 2010

Garett D Johnson and **Nicholas R Waytowich** and Daniel J Cox and Dean J Krusienski. *Extending the discrete selection capabilities of the P300 speller to goal-oriented robotic arm control*. 2010

Nick Waytowich and Ganna Kudrey and Daniel Cox. *Assistive Robotic Applications of a Staubli Manipulator for Use with the BCI 2000*. 2010

Ph.D. Dissertation

Title *Development of a Practical Visual Evoked Potential Based Brain-Computer Interface*

Advisor Dean J. Krusienski

Description Optimized visual stimulus design and developed novel paradigmatic approaches to create a practical visual evoked potential based brain-computer interface. Additionally, a custom BCI software platform was developed and implemented with the Google Glass (HMD device) for ergonomic deployment.

Honors, Awards, Societies and Service

2021 Won 1st place and the award for the most human-like agent at the NeurIPS 2021 MineRL Benchmark for Agents that Solve Almost-Lifelike Tasks (BASALT) competition.

2018 Winner of the Counter-sUAS Hackathon hosted by MD5 and the Army Futures Command, Austin Texas

2018 Human Research and Engineering (HRED) Excellence in Science award for the development Deep-TAMER (teaching agents mantually through evaluative reinforcement), Army Research Lab.

2017 Human Research and Engineering (HRED) Excellence in Engineering award for the development of the Human-AI Image Labeler (HAIL), Army Research Lab.

2012 Graduate Assistantship In Areas of National Need (GAANN) Scholarship Award Recipient (2012)

2011-Present Member of Association for the Advancement of Artificial Intelligence (AAAI), IEEE Member, Society for Neuroscience, American Society of Mechanical Engineers

2009-2010 President of the Florida Engineering Society at the University of North Florida Chapter

2010 1st place regional winner of the MATE ROV (Marine Advanced Technology Education for Remotely Operated Vehicles) Competition in Coco Beach FL

Skills

Research Machine Learning and Reinforcement Learning, Multi-agent systems, Deep Convolutional Neural Networks, Signal Processing, Reinforcement Learning, EEG Signal Mapping and Characterization, BCI Development, Data Mining and Visualization

Programming Tensorflow, PyTorch, Python, ROS, Matlab, C, C++, C#, Java, Android, .NET, HTML, Javascript, OpenGL, DirectX, XNA, LaTeX, OpenOffice, Linux, Embedded Systems, Microcontroller Programming