Jacob Keller

www.linkedin.com/in/jacob-r-keller

Email : keller.974@osu.edu
Mobile : (859) 802-7976

Education

- **Ohio State University** — Columbus, OH
  Bachelor of Science in Human Systems Integration — *Aug. 2017 – Dec. 2020*
  My undergraduate degree in Human Systems Integration was a unique course of study co-sponsored by faculty in the Department of Integrated Systems Engineering and Department of Psychology to provide a highly interdisciplinary and challenging curriculum. Coursework has included cognitive systems engineering, cognitive psychology, design, visual analytics, and aviation human factors, among related subjects.

Experience

- **Resilient Cognitive Solutions** — Pittsburgh, PA
  Cognitive Systems Engineering Intern — *Summer 2019 and 2020*
  - **Decision Support Software Systems**: Contributed to the design of decision support systems for intelligence analysts and cybersecurity experts. Leveraged Applied Cognitive Work Analysis and associated analytic frameworks to develop software tools which utilize fundamentals aspects of visual attention and cognitive psychology to support practitioners in complex environments. Created decision support GUI elements that provide affordances to practitioners facing data overload in complex work environments. Became proficient in Adobe Illustrator, Indesign, and other software tools supporting this work.
  - **Cyber**: Participating in internal war gaming for the development of a cybersecurity decision support system. Researched and designed hypothetical cyber attacks, drawing inspiration from documented methodologies of North Korean and Chinese cyber-criminals.
- **Cognitive Systems Engineering Laboratory, Ohio State University** — Columbus, OH
  Undergraduate Research Assistant — *August 2018 - Present*
  - **Human-Robot Interaction**: Conducted literature search for an experimental virtual test bed to enable cost effective simulations of human-robot space operations that entail high ecological validity. Involved in iterative development of testbed assets which has included the tasks of considering potential settings and experiment scenarios to test resilience in complex, multi-agent teams. Current
  - **Intelligence Analysis Experiment**: Contributed to the design of an experiment focusing on human-machine teaming for intelligence analyst teams, testing varying types of human-machine system intrusiveness, communication rates, and general features.
  - **Software Resilience Engineering**: Conducted extensive literature search surrounding the coordinative and collaborative behavior of remotely distributed DevOps software engineers. Work was performed as a component of the SNAFUCatchers consortium at Ohio State, supporting inquiry into the costs of coordination for anomaly response tasks with remotely distributed teams.

Publications

- **Keller, J., IJtsma, M. (In-Progress) Quantifying Multi-Agent Team Performance through Resilience: A Novel Test-bed for Human-Robot Teams**:
  Addresses questions about the envisioned teamwork of humans and robots in complex multi-agent systems, highlighting the need to discuss more holistic and agent-agnostic methods for quantifying team performance. These needs are proposed to be met by the development of a novel testbed for human-robot interaction experiments at OSU.
- **Keller, J., IJtsma, M., & Newton, E. (In-Progress) A Critical Examination of Autonomous Flight Safety Systems from a Cognitive Systems Engineering Perspective: Challenges, Themes, and Outlying Risks**:
  Examines automated self-destruct systems for space launches. Lays the case that there are implicit and unconsidered engineering trade-offs associated with delegating mission-critical decision making to an automated agent. Abstract was accepted to 2020 International Astronautical Conference but withdrawn due to COVID-19.

Projects

- **Autonomous Flight Safety Systems (January 2020 - May 2020)**:
  Our student team was funded by the Federal Aviation Administration to investigate issues within the evaluation of autonomous flight safety systems (AFSS) for commercial space launches. Extensive analysis including travel to Cape Canaveral and the FAA headquarters and conducting semi-structured interviews with over eighty stakeholders from industry and government. A policy solution was delivered to the FAA outlining a path forward to enable the growth of the commercial space sector without compromising the safety of the public.