SILVER LINING FATIGUE MITIGATION
Innovations From the Field

The Fatigue and Sustained Attention Performance Impacts Team in the Cognitive Models Core Research Area was a part of an exciting opportunity to examine fatigue in the Missileer community and see the actionable results from that research. In 2020, the 20th Air Force enacted long-duration field operations to safeguard personnel from the SARS CoV-2 (COVID-19) Pandemic, resulting in significant changes to their workload and speed of operations. The 341st Missile Wing at Malmstrom Air Force Base used this opportunity to study fatigue mitigation strategies, including sleep, fitness, and nutrition education, as well as alternate alert durations and shift schedules.

Our team provided data analysis and interpretation support for the study which identified a viable alternative schedule that emphasizes protected recovery and dedicated squadron training times that can be continued at the conclusion of pandemic operations. Subsequently, this will create schedule stability. When compared to the 24-hours-on and 24-hours-off alert cycles, the interventions implemented during the study improved satisfaction among Missileers in areas such as medical readiness and physical and mental health.

Due to the documented improvements across health measures and subjective impressions of the Missileers, the 20th Air Force decided to adopt the scheduling model implemented under the study. Not only did this study contribute to operator safety and effectiveness during the pandemic, but it's estimated that the interventions will result in a 74.6% medical readiness improvement, increased 13N morale, and annualized fuel savings of $75,000 for the Air Force. ☆

Dr. Megan Morris, Cognitive Models CRA, 711 HPW/RHWM

The 341st Operations Group enlists the aid of the 490th Missile Squadron to obtain and manage Malmstrom Air Force Base's intercontinental ballistic missiles.

Photos by Senior Airman Daniel Brosam

SUMMER AT THE GRILL 2021

The Gaming Research Integration for Learning Laboratory (GRILL®) started its summer STEM (science, technology, engineering, mathematics) program on 07 June 2021. The program is back to its full-length operation after being reduced last year because of the coronavirus pandemic (COVID-19). However, the GRILL is still maintaining social distancing procedures due to being an in-person program.

For the summer, the GRILL is hosting 15 Wright Scholars, 2 undergrad interns, 10 teachers, and the following faculty researchers: Dr. Denny Yu (Purdue University), Dr. Kelsey Merlo (University of South Florida), Dr. Chang-Geun (Kent State University), and Dr. Summer Rebensky (Florida Institute of Technology). An Education intern, a STEM outreach coordinator, and several mentors support the program. Together, these participants are working on community-driven challenge problems.

THIS SUMMER'S CHALLENGE PROBLEMS INCLUDE:

▶ An Augmented-Reality tool capable of real-world object recognition and model targeting.

▶ A virtual satellite environment with physics to mimic orbit and movement while in space.

▶ A virtual environment for utilizing drones in search and rescue operations.

▶ A virtual trainer that integrates physiological monitoring to provide real-time feedback for an anti-G-Force straining maneuver performed by pilots.

▶ A virtual environment with accurate 3D models to rehearse extracting astronauts from a SpaceX Dragon Capsule after reentry.

Upon completion of these projects, the students will present their work to community stakeholders. They and the teachers will also publish their work on the GRILL website (www.af-grill.com). This hands-on program provides its participants with opportunities to experience real-world research and gain invaluable career skills. ☆

1st LT Kyle Bucklew, GRILL Program Manager, 711 HPW/RHWM

Photos by Mr. Will Graver

Over the summer, students and their institutions collaborated with the Warfighter Interactions and Readiness Division to establish a successful quarter of research with various internship programs. Through their combined efforts and honed problem-solving skills, they focused on producing results for their research, while they and the division overcame any of the setbacks generated by the height of the pandemic. Below is an overview of the interns, along with their mentors and programs.
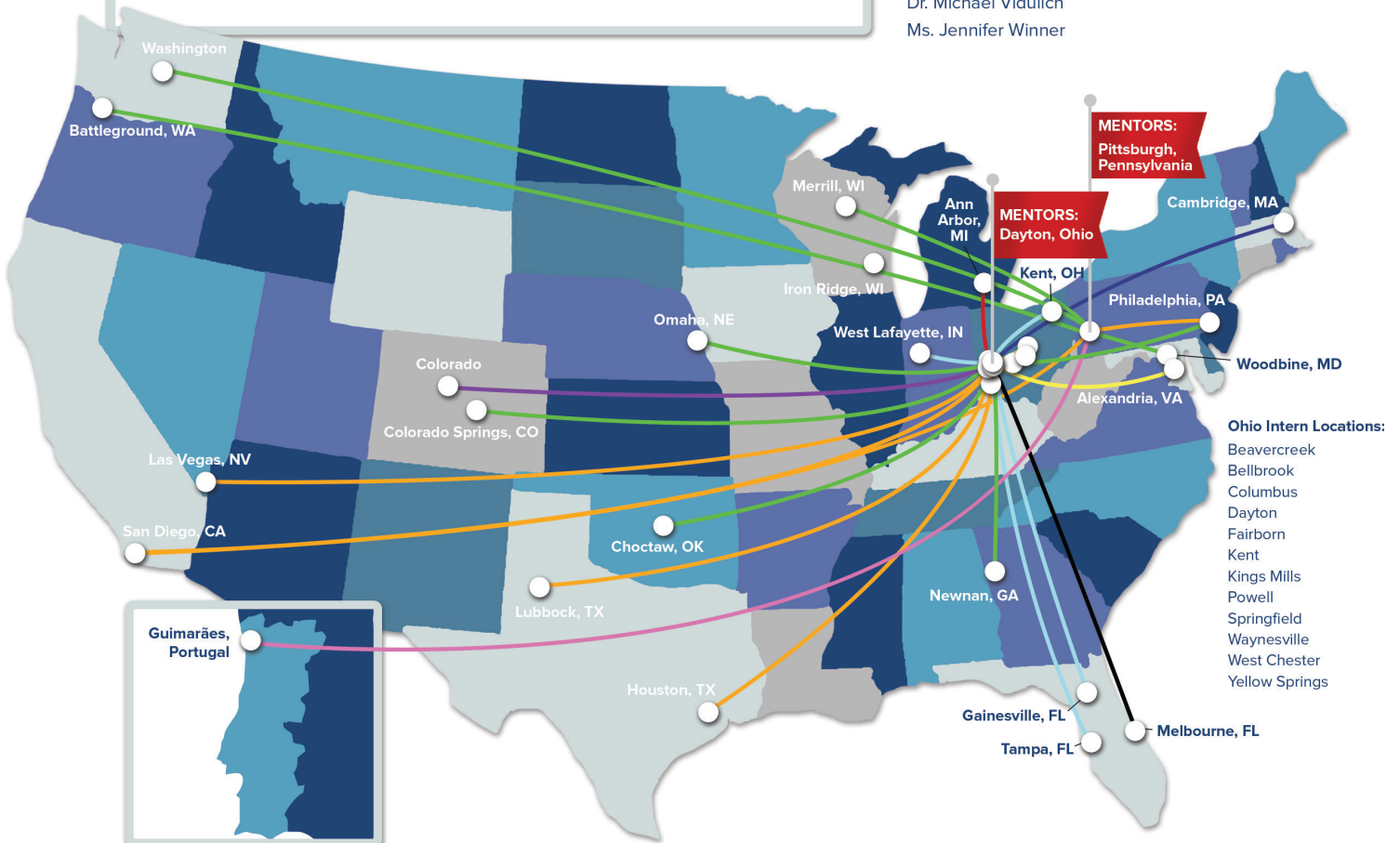
KEY

- ◯ Interns' Locations
- ▢ Goodwill Ambassador Program (Dayton, OH)
- ▢ Repperger Research Intern Program
- ▢ ORISE Visiting Collaboration Initiative
- ▢ Air Force Academy Program / Cadet Summer Research Program
- ▢ USAFA Ops Air Force
- ▢ GRILL Summer Internship
- ▢ NRC Post-Doc Research
- ▢ Wright Scholar Program
- ▢ Center of Excellence Program
- ▢ Summer Faculty Fellowship Program

Dayton Mentors:

Dr. Winston Bennett
Lt Kyle Bucklew
Ms. Emily Conway
Mr. Jon Diemunsch
Mr. Tyler Frost
Mr. Jack Hu
Mr. Jerry Huggins
Mr. Sean Kennedy
Dr. Kathleen Larson
Dr. Megan Morris
Dr. Chris Myers
Mr. Timothy Rodabaugh
Dr. Griffin Romigh
Dr. Chris Stevens
Dr. Eric Thompson
Dr. Michael Vidulich
Ms. Jennifer Winner

Pittsburgh Mentor:

Dr. Leslie Blaha

Map labels:
Washington
Battleground, WA
Merrill, WI
Ann Arbor, MI
Cambridge, MA
MENTORS: Pittsburgh, Pennsylvania
MENTORS: Dayton, Ohio
Kent, OH
Iron Ridge, WI
Philadelphia, PA
Omaha, NE
West Lafayette, IN
Woodbine, MD
Colorado
Alexandria, VA
Colorado Springs, CO
Las Vegas, NV
San Diego, CA
Choctaw, OK
Newnan, GA
Lubbock, TX
Guimarães, Portugal
Houston, TX
Gainesville, FL
Melbourne, FL
Tampa, FL

Ohio Intern Locations:
Beavercreek
Bellbrook
Columbus
Dayton
Fairborn
Kent
Kings Mills
Powell
Springfield
Waynesville
West Chester
Yellow Springs

Graphic by Ms. Shania Horner

Photo by US Air Force

AIR FORCE FUTURES

Over the last year, Air Force Futures (AF A5/7) has emerged as a critical organization for Air Force planning and requirements. Since they've acquired and maintain their role as "the voice of tomorrow's Airmen," the Air Force Research Laboratory (AFRL) established a program in 2020 to send small cohorts of scientists and engineers (S&Es) to serve as technical advisors at AF Futures on 6-month rotational assignments. Coming from the Warfighter Interactions and Readiness Division (RHW), I was selected to be a member of the first cohort of five S&Es to participate in this initiative.

The cohort was closely aligned with the Disruptive Technology Team at AF Futures, a small team focused on connecting organizations within and beyond both the Air Force and Department of Defense (DoD). These organizations support the discovery and advancement of novel technology concepts that offer game-changing capabilities for the future of the Air Force. From there, cohort members were able to reach out across the AF Futures organization to identify connections, establish and build relationships, and contribute to specific activities.

My main activity at AF Futures was to advance the concept of Just in Time Multi-Mission Airmen/Warfighters (JITMMA/W). I led an industry-wide engagement that drew more than 300 responses, leading to capability briefings by more than 30 companies with technologies relevant to the overall concept. I also advanced other human performance-enhancement technologies under development at AFRL, which AF Futures identified as part of their discovery and incubation efforts. In addition to this direct support of interactions between AFRL and AF Futures, I also worked with both the Human Capital, Modeling & Simulation, Air Battle Management System (ABMS), and Artificial Intelligence Teams to highlight human capital issues, along with relevant AFRL research and expertise that could contribute to their requirements definition and planning efforts. ☆

Dr. Glenn Gunzelmann, Training Core Technical Competency Lead, 711 HPW/RHW

NEWS FLASH

PUBLISHED CONTENT

Lebiere C, Blaha LM, Fallon CK and Jefferson B (2021) Adaptive Cognitive Mechanisms to Maintain Calibrated Trust and Reliance in Automation. Front. Robot. AI 8:652776. doi: 10.3389/frobt.2021.652776
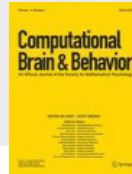
Lee, M.D., Gluck, K.A. Modeling Strategy Switches in Multi-attribute Decision Making. Comput Brain Behav 4, 148–163 (2021). https://doi.org/10.1007/s42113-020-00092-w

711TH HPW/RHW

Hails

Maj Thomas Payne • 1Lt Corey Rucker
Lt Col James "J.R." Lievsay • Capt Mitchell Cochell
TSgt Javar Graham • 1Lt Ariel Aharon

Farewells

Mr. Jason Davis • Capt Jessica McCool
Mr. Bill Kosnik

2021 SECOND QUARTER AWARDS

711 HPW

Company Grade Officer
Capt Jonathan Powers

Civilian Category III
Dr. John "Chris" Brill

RH

Senior Noncomissioned Officer
MSgt Paul DuCharme