Defense & Security Planning Workshop Summary

The research strategic planning workshop on Defense & Security was held August 20th and 21st at UA’s Biosphere2. Participants from multiple units across campus gathered for the workshop. The opening reception included welcome remarks by Dr. Kimberly Andrews Espy and a presentation on “Computational, Compressive, and Task-specific Imaging” by Prof. Mark Neifeld, Department of Electrical and Computer Engineering at UA. The second day breakout sessions focused on the following topics moderated by UA experts, which are both UA strengths and of significant national need with opportunities for external funding growth at UA:

1) Food Security;
2) Situational Awareness for the Multi-Nodal World, Cybersecurity;
3) Measuring and Optimizing Human Performance;
4) Atoms to Airplanes: Computational Design, Develop, Deploy.

The session leads reported back to the full group for discussion. The following items represent recommendations and suggestions for ORD-supported activities identified during these full-group discussions:

1. **Assist in positioning UA faculty groups to be knowledgeable and competitive for future funding initiatives from federal agencies.** ORD support was requested for UA faculty to receive timely insight on future areas of interest/focus for funding agencies, preferably with an 18-month lead to help develop competitive proposals.

   a. Invite critical input from funding agencies to UA to describe the current challenges and priorities for their agencies, e.g., under a new seminar series. These seminars would be focused on important (and possibly yet to be funded) issues and challenges, and help identify/kick-start research activities at UA. ORD has engaged Lewis-Burke Associates, LLC for federal agency engagement consulting services, who can augment this process.

   b. Provide (partial) travel support for faculty to actively participate in funding agency workshops, from which subsequent solicitations are often written.

   c. Connect group members virtually across campus as part of the collaborative process, potentially augmenting the Experts database already available, adding current analytics from publications, proposal summaries, and invention disclosures.

   d. Continue centralizing streamlining and speeding services for common equipment on campus so that users can readily connect with each other through these nodes, and to create university level facilities where external partners can visit for funded research.

   e. Consider methods of sharing highly trained personnel to be able to more quickly respond to project opportunities.

   f. Provide pilot funds for projects leading to new externally funded programs (ORD seed money and support personnel are available for new center or multidisciplinary teams to pursue major funding. For more details consult the “Incubating New Interdisciplinary Research Programs: Start for Success” and the “Catalyzing New Interdisciplinary Research Programs: Accelerate for Success” descriptions on the UA Research Gateway).
2. **Exploit Arizona’s unique situation to expand opportunities in Food Security and One Health research.** The importance of AZ for food security is reflected by 95%+ of U.S. winter crops being grown near Yuma, the absence of waterfowl who vector disease to poultry, and food-industry companies moving to AZ along the CA-AZ border. UA has strengths in health sciences, animal and comparative biomedical sciences, genomics, remote sensing, nutrition, etc. which can be brought together to identify specific projects and funding opportunities. It was suggested to bring together experts across UA for a broad workshop on Food Security.

3. **Support a “network on networks.”** Internal workshops and/or working groups supported by ORD were suggested to facilitate multidisciplinary integration of faculty in the area of networking. UA has multiple competences and faculty to address situational awareness for the multi-modal world. Our expertise in networks is a unique strength UA can bring to cybersecurity research, as well as a multitude of other areas. A suggestion was made to enhance an existing seminar series on networking, to gather additional experts and seek additional program funding.

4. **Unify strengths in proteomic, sensors, precision medicine, social/neurosciences and informatics to optimize human performance.** A new Human Performance group was proposed, whose research focus would span genomics, proteomics, real-time wearable devices for measuring human physiological, behavioral, and psychological responses to environmental variables and potentially extend to the Internet of things. It would also include cultural and linguistic competencies. Davis-Monthan AFB was noted as an outstanding local resource and potential partner for such a center. Such system-wide expertise would also be of interest to educational, medical, athletic, and defense industries and agencies.

5. **Explore where UA can build collaborative computational/experimental materials science platforms that are targeted at future agency funding opportunities.** NSF and other agencies are interested in materials research that includes both simulation and testing to rapidly design materials with proven characteristics. There is interest in meetings/pilot projects to be competitive for the next round of NSF materials directorate programs. Such projects should include sensors and networking as well as computational and experimental materials experts. Additionally, access to state-of-the-art facilities and instrumentation is required to compete. 3D printing, additive manufacturing, biologically inspired manufacturing, and a maker space were highlighted as priorities. A coherent plan to replace or upgrade core facilities also needs to consider niches that are attractive to external funders such as industry.

**Next Steps:**

Workshops, pilot programs, and continued discussion are evolving around the topic areas mentioned above. For additional information please contact Jennifer Barton at barton@email.arizona.edu or Neal Armstrong at nra@email.arizona.edu. For information on the breakout session groups, including how to participate in follow-on meetings, please contact the group lead:

- **Food Security**, contact Andre-Denis Wright, School of Animal and Comparative Biomedical Sciences, adwright@email.arizona.edu.
Situational Awareness for the Multi-Nodal World, Brint Milward, School of Government and Public Policy, milward@email.arizona.edu.

Measuring and Optimizing Human Performance, Esther Sternberg, Arizona Center for Integrative Medicine, and UA Institute on Place and Wellbeing, esternberg@email.arizona.edu.

Atoms to Airplanes: Computational Design, Develop, Deploy, Erica Corral, Materials Science Engineering, elcorral@email.arizona.edu, or Jeff Pyun, Chemistry & Biochemistry, jpyun@email.arizona.edu.