



15 February 2024

Invitation to Serve: Robotics Target Area Task Force

Geoff Hollinger, Associate Professor, School of Mechanical, Industrial, and Manufacturing Engineering – **Co-chair**

Kagan Tumer, Professor, School of Mechanical, Industrial, and Manufacturing Engineering – **Co-chair**

Jessica Garwood, Assistant Professor, College of Earth, Ocean, and Atmospheric Sciences

Sam Logan, Associate Professor, School of Exercise and Sport

Chris Sanchez, Associate Professor, School of Psychological Science

Inara Scott, Associate Professor, School of Marketing, Design, and Analytics

Susanne Stieger, Professor, Veterinary Clinical Sciences

Ashley Thompson, Assistant Professor of Horticulture, Wasco and Hood River Counties

Heesung Woo, Assistant Professor, Forest Ecosystems and Society

Dear Colleagues:

One of the three goals in *Prosperity Widely Shared*, our new strategic plan, is to position OSU as a research university that is *especially distinctive* for its contributions to big discoveries that drive big solutions to the world's most vexing challenges, even as we continue conducting groundbreaking foundational research, scholarship, and creative activities. Under that goal, a key action over the 2024 to 2030 period is to build distinction in *four focus areas* where we believe we can establish lasting global competitive advantage: climate science and related solutions; clean energy and related solutions; robotics; and integrated health and biotechnology. These four areas are interconnected and will be supported by new foundational strengths build across the university in artificial intelligence, data science and research computing, and the integration with creative work and research in the arts and humanities.

To advance this work, we are establishing four task forces to develop action plans for each of the four focus areas. Irem Tumer, vice president for research and innovation, and Alix Gitelman, vice provost for academic affairs and senior vice provost, will work together to oversee the work of the task forces. They will take the lead in receiving, evaluating, and sharing task force recommendations to inform the larger university community about tangible actions.

The third of the four task forces we are charging is for **Robotics**, and I invite you to be a member. I'm pleased that Geoffrey Hollinger, Associate Professor in the College of Engineering and former director of the Robotics Interdisciplinary Graduate Program, and Kagan Tumer, Professor in the College of Engineering and Director of the Collaborative Robotics and Intelligent Systems (CoRIS) Institute, have agreed to co-chair this task force.

Target Area Rationale: Robotics technology has advanced at a breathtaking rate over the past

decades. While robots were once limited to the factory floor in industrial and manufacturing applications, they now operate with minimal human support and impact every facet of our lives: teams of uncrewed aerial vehicles (UAVs) and underwater vehicles (AUVs) collect data to address critical questions for our farmers, scientists, and military; autonomous ground vehicle (UGV) technology is making its way into our cars, farm equipment, and all the machinery that mines our resources; robots equipped with advanced manipulators now start to perform tasks previously reserved for highly-dexterous human hands in hospitals, farms, forests, and oceans; and personal robots that interact with us in more and more natural ways are entering our homes and offices to help us with our day-to-day tasks. Not only do all those systems promise to transform our lives, they also all share one key feature: they heavily rely on recent advances in AI.

This proliferation of robotic systems, intertwined with AI growth, brings with it concerns about privacy, economic impact, and ethical consideration. It is imperative that OSU remains at the forefront of the development of these technologies, continues to train the next generation of technicians, researchers, and innovators, and manages the increasingly complex impact of robotics on society. This endeavor requires an inherently transdisciplinary approach, and OSU is uniquely positioned to address these problems by leveraging our world-class researchers across many colleges. To name just a few areas of strength in Robotics at OSU, our researchers in Forestry are designing UAVs to monitor forest canopies, our colleagues in CEOAS are deploying autonomous gliders to continuously monitor the ocean, our faculty in Agricultural Sciences are utilizing state-of-the-art robotics technology to pick fruit and monitor the health of crops, and our faculty in Engineering are designing AI approaches to provide the underlying intelligence for many of these systems.

Finally, OSU also hosts one of the handful of Robotics MS/PhD graduate programs in the nation, which has produced dozens of world-class alumni over the last decade who are currently innovating in industry, academia, and government. Determining how Robotics and AI at OSU will grow is of critical importance to understand and manage the impact of Robotics and AI on our world.

Approach: Building international competitive advantage in each of the four focus areas will require a well-aligned mix of integrated actions across the mission elements of research, teaching, and public engagement. Of paramount importance are: the strength of our faculty, strong departments and schools as homes for those faculty; related high quality undergraduate and graduate degree offerings; programs and resources that facilitate interdisciplinary and transdisciplinary research and teaching; and a strong research and innovation infrastructure. As we seek to recruit and support faculty and invest in other support for this focus area, this comprehensive approach is essential to achieving true and lasting advantage relative to OSU's competing peer institutions.

Tasks: The task force will develop an action plan in *two phases*.

Phase I—Strategic Opportunities. This initial part of the task force work will answer the following questions using results from interviews with ~40-50 faculty members:

- How can OSU leverage its world-class faculty and research facilities, including the supercomputer in the HCIC, to make the next generation of discoveries in Robotics?

- How can OSU leverage its stellar record of community-engaged transdisciplinary scholarship to develop solutions for future robotic systems, its impacts on the economy, how we do research, and on society?
- What is the current faculty talent level and unique capabilities at OSU, and how can each contribute to accelerate breakthroughs and impact? Where do we have gaps in the faculty expertise needed to achieve our goals?
- What is the status of graduate and undergraduate degree programs related to this area and where are opportunities to build additional strength?
- What can be learned from the research exemplar work by the Office of Research Advancement and associate deans for research, particularly with respect to existing or potential intersection with the other three target areas?
- What are key themes within this focus area of Robotics?

Phase II—Action Plan. This second part will focus on creating a prioritized list of themes and related investments distinguishing between short (2 years) and longer (3-5 years) time horizons. This work at a minimum should take into account (1) the results of the **Phase I** interviews; (2) the research framework, exemplars, and the Hanover competitive intelligence report that was input to the new strategic plan; and (3) engagement with key internal and external stakeholders, expertise across the university, and consider other available recent university-wide data reports. This part of the charge may be updated given the outcomes of the **Phase I Reports** by the four task forces.

Timeline: The task force should submit the **Phase I Report** no later than 15 April 2024 and the **Phase II Report** no later than 1 June 2024 to Irem and Alix.

Thank you for your willingness to serve on this task force and the work you will do in advancing our goals in this important domain.

Sincerely,



Edward Feser
Provost and Executive Vice President