

Towards Tactile Orchard Robotics

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Recent surveys shows that automation/robotics is one of the top priorities for specialty crop producers in the United States. Despite decades of research, efforts to deploy robots that can harvest, prune, and thin have not been commercially implemented. Much of the prior work has focused primarily on visual perception (e.g. fruit detection and localization), often ignoring the complex interactions that occur during manipulation of the crop. This talk will highlight ongoing efforts within the Intelligent Machines and Materials Lab to develop dexterous manipulation incorporating tactile perception for the agricultural domain. Some of the projects discussed will include tactile sensor design, end effector design, and the use of physical twins for controller development. This talk will also discuss parallel efforts to advance tactile manipulation in the underwater domain.



Joe Davidson is an Assistant Professor in the School of Mechanical, Industrial, and Manufacturing Engineering at OSU where he directs the Intelligent Machines & Materials Lab (IMML). He received his B.S. from the U.S. Military Academy at West Point, NY in 2004. After serving in the military for five years, Joe worked as a project manager for the CH2M HILL Plateau Remediation Company at Hanford, Washington from 2009 to 2012. He received his M.S. and Ph.D. from Washington State University and was a postdoctoral research associate in the Department of Mechanical Engineering at the Massachusetts Institute of Technology from 2016 to 2018. Some of his current research interests include manipulation, tactile sensing, and end effector design.

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