JUAN PABLO WACHS

Regenstrief Center for Healthcare Engineering Scholar
Associate Professor, School of Industrial Engineering
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About me

Welcome to my website! I am an associate professor at Purdue University, at the School of Industrial Engineering. Previously, I was a postdoc fellow at the Naval Postgraduate School, at the MOVES institute. I worked on problems related to body posture recognition, subresolution tracking and surveillance applications.

I am the head of the Intelligent Systems and Assistive Technologies Lab. This laboratory is the main center of research for PhD, master students and some undergraduates in the field of robotics applied to healthcare. We currently have multiple robotic plataforms as sensors that we use to explore new ways to interact and program robots in natural and intuitive ways.

Research Overview

My research is focused on two connected disciplines related to machine vision: intelligent systems and human-machine interfaces. In both fields, I am intrigued by the means of interaction between robots to people through visual meaningful features. In human-machine interfaces, I aspire to design visual algorithms that are capable to mimic visual perception tasks such as motion tracking, object recognition, efficient human body-posture recognition, and behavior modeling and understanding. In intelligent systems, my focus is oriented to enable robots and devices to perform high level tasks with speed and efficiency based on visual clues from complex and cluttered environments.

Teaching (not updated)

IE 590 (Fall 2013)	Robotics & Machine Vision
IE 474 (Fall 2013)	Industrial Control Systems
IE 474 (Spring 2013)	Industrial Control Systems
IE 690 (Spring 2013)	Gestures & Body Interaction Systems
IE 332 (Fall 2012)	Computing in Industrial Engineering

Funding

1. Agency/Title of Grant:QNRF
“Robotic Assistants in Operating Rooms in Qatar “Theory, Development and Integration”
Duration of Funding (Dates): 2013-2015
Total amount of award (Pending): $1,000,050

2. Agency/Title of Grant:AFORS Young Investigator
“Embodied Interactions in Human-Machine Decision Making for Situation Awareness Enhancement Systems”
Duration of Funding (Dates): 2013-2015
Total amount of award: $358,857

3. Agency/Title of Grant:OVPR Laboratory Equipment Program
“A Dual Robotic Arm to Enhance Cross-disciplinary Capabilities and Exploration”
Duration of Funding (Dates): N/A
Total amount of award: $100,000

4. Agency/Title of Grant: Indiana Clinical and Translational Sciences Institute
“Gestonurse: A Robotic Scrub Nurse That Understands Hand Gestures”
Duration of Funding (Dates): One (1) year 08/01/2012-07/31/2013
Total amount of award: $75,000

5. Agency/Title of Grant: Endologix
“Challenges of Selective Catheterization across the Aortic Bifurcation with different Endografts”
Duration of Funding (Dates): One (1) year 04/10/2012-05/15/2012
Total amount of award: $14,265

6. Agency/Title of Grant: Discovery Park Seed Grant
“Collaborative Assistive Robotics”
Duration of Funding (Dates): One (1) year 09/01/2010-08/31/2011
Total amount of award: $36,795

7. Agency/Title of Grant: Purdue Research Foundation
Title: “Distributed Sensor Fusion Methodology In "intelligent Rooms" For Assisted Living Facilities”
Duration of Funding (Dates): One (1) year 06/01/2010-05/31/2011
Total amount of award: $16,795

8.Agency/Title of Grant: AHRQ R03 HS019837-01
Title: “Context-Based Hand-Gesture Recognition for the Operating Room”
Duration of Funding: Two (2) years 09/30/2010-09/29/2012
Total amount of award: $100,000

9.Agency: Indiana Clinical and Translational Sciences Institute
Title: “A Window on Tissue” - Tissue Depth Visualization using Face Orientation for Laparoscope Control
Duration:One (1) year 11/19/2009-11/10/2011
Total amount of award: $9,685

Awards

1. Awarded the 2013 Air Force Young Investigator Program (YIP)
1. Awarded the 2012 Air Force Summer Faculty Fellowship Program (SFFP).

2. Best Paper Award Finalist IEEE International Conference on Systems, Man, and Cybernetics, October 9-12, 2011, Anchorage, Alaska.

3. Research Associateship Program Award, "*A Training and Assessment Tool for Warfighter Tasks*", awarded by the National Academies of Sciences (2008-2009).

4. Excellence Scholarship, Ben Gurion University of the Negev, Jun. 2004- Jun. 2006.

5. Best Paper Award EURO Tenth Latin American Association of Operations Research Summer School (X ELAVIO); Uruguay, 2004.

5.Best Student Paper Award. The 12th Annual Conference of Industrial Engineering and Management, Ashkelon, Israel, 2002

Press Coverage

September, 2013	"Surgeons could use his hand-gesture system to control robots", *IEEE Spectrum*
February, 2011	"Camera ensures control of robotic nurse is all in hand" *the Engineer.* "Future Technology in the OR Could Decrease Surgery Times, Risk of Infection" *Infection Control Today*. "Future surgeons may use robotic nurse, 'gesture recognition'" *Purdue Featured News*
June, 2008	"Surgeons may get Minority Report-style display" *NewScientist Magazine*, pp: 23.
October, 2006	`Gestix' in Beyond Tomorrow". *Beyond Tomorrow (Australian TV Show). Stories, Episode 15, e-medicine*, www.beyondtomorrow.com
Sept. 2005	How to choose grad school?" *Resources, IEEE Spectrum Magazine, pp: 59-62.*