



## **FCRAR 2002**

The 15th Florida Conference on Recent Advances in Robotics and  
Robot Showcase

Florida International University  
Miami, Florida

May 23-24, 2002

### **Technical Sessions**

#### **1A Mobile Platforms**

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**10:30 – 12:30 Thursday, May 23, GC 243 West**

**Session Chairs:**     **Dr. Pierre Larochelle, FIT Melbourne**  
                              **Dr. Cesar Levy, FIU Miami**

10:30 – 10:45

L. Zamstein, and A. A. Arroyo, “SID: A Seeing Eye Robot,” University of Florida, Gainesville.

10:50 – 11:05


S. Nortman, A. A. Arroyo, M. C. Nechyba, and E. M. Schwartz, “PNEUMAN: A Humanoid Robot Implementation,” University of Florida, Gainesville.

11:10 – 11:25

J. W. Grzywna, N. M. Ivano, E. M. Schwartz, and A. A. Arroyo, “KELVIN: A Second Generation Land Vehicle,” University of Florida, Gainesville.

11:30 – 11:45

C. R. Fulmer, C. D. Crane, and D. G. Armstrong, “Design and Fabrication of an Omni-Directional Vehicle Platform,” University of Florida, Gainesville.



11:50 – 12:05

S. Jantz, and K. L. Doty, “PDA Based Real-Time Vision System for a Small Autonomous Mobile Robot,” University of Florida, Gainesville.

12:10 – 12:25

J. Blanch, and S. Tosunoglu, “Control of Mobile Platforms via Handheld PDAs,” Florida International University, Miami.

## **1B Control**

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**10:30 – 12:30 Thursday, May 23, GC 241A**

**Session Chairs:**      **Dr. Rodney Roberts, FSU-FAMU Tallahassee**  
                                  **Dr. Oren Masory, FAU Boca Raton**

10:30 – 10:45

P. Chen, and I. N. Tansel, “Open Architecture Control System for Miniature Machine Tools,” Florida International University, Miami.

10:50 – 11:05

N. Gupta, C. Ordonez, and A. Barreto, “Modification of Head-Related Transfer Functions to Improve the Spatial Definition of Virtual Sounds,” Florida International University, Miami.

11:10 – 11:25

Z. Roth, “Computer-Aided Control Systems Course Instruction,” Florida Atlantic University, Boca Raton.

11:30 – 11:45

H. Zadegan, and A. Zilouchian, “Frequency Domain Controller Design and Order Reduction for Large-Scale Systems,” Florida Atlantic University, Boca Raton.

11:50 – 12:05

Y. Zhao, and H. Zhuang, “A Fuzzy-Logic Based Trust Model for e-Commerce,” Florida Atlantic University, Boca Raton.

12:10 – 12:25

H. Aljibury, A. A. Arroyo, and M. C. Nechyba, “Using Locally Weighted Regression to Enhance Q-Learning,” University of Florida, Gainesville.



## 2A Navigation

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13:45 – 15:30 Thursday, May 23, GC 243 West

**Session Chairs:**      **Dr. Dan Cox, UNF Jacksonville**  
                                 **Dr. Laura Pullum, FIU Miami**

13:45 – 14:00

E. Zawodny, and C. Crane, “Multiple Vehicle Positioning and Placement Optimization,”  
University of Florida, Gainesville.

14:05 – 14:20

S. Kanowitz, M. C. Nechyba, and A. A. Arroyo, “Design and Implementation of a GPS-Based  
Navigation System for Micro Air Vehicles,” University of Florida, Gainesville.

14:25 – 14:40

K. J. Walchko, and P. A. C. Mason, “Inertial Navigation,” University of Florida, Gainesville.

14:45 – 14:50

Javier Llera, Sammy Carswell, Michael Fischer, Tony Argote, Christopher Argote, Jedidiah Jean  
Charles, and Niki Reaves, “Rebecca,” Miami Coral Park Senior High School, Miami.

Brougher Bass, and Jim Payne, “FIU Mechanical Engineering/Stranahan Engineering Magnet  
Partnership,” Fort Lauderdale.

14:55 – 15:10

R. C. Chandler, A. A. Arroyo, M. C. Nechyba, and E. M. Schwartz, “Autonomous Agent  
Navigation Based on Textual Analysis,” University of Florida, Gainesville.

15:15 – 15:30

C. Ordonez, A. Barreto, and N. Gupta, “Use of 3-D Audio as a Navigational Aid for a Virtual  
Environment,” Florida International University, Miami.

## 2B Sensors and Manufacturing Applications


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13:45 – 15:30 Thursday, May 23, GC 241A

**Session Chairs:**      **Dr. Armando Barreto, FIU Miami**  
                                 **Dr. Rodney Roberts, FSU-FAMU Tallahassee**

13:45 – 14:00

P. A. Diehl, P. Chen, and I. N. Tansel, “Electro-Optic Vibration Sensor for Micro-Machining,”  
Florida International University, Miami.



14:05 – 14:20

J.-P. Clerc, U. A. Tol, G. J. Wiens, M. Lindstrom, Y. Steene, and N. K. Jhaveri, “Deburring Using A Micro/Macro Parallel Kinematic Machine,” University of Florida, Gainesville.

14:25 – 14:40

O. Masory\*, and C. Favrot\*\*, “Determination of Impact Force and Crush Energy Using Sensory Data and Comparison with Results of Other Algorithms,” Florida Atlantic University\*, Boca Raton, IFMA – Institut Francais De Mecanique Avancee\*\*, France.

14:45 – 14:50

Andrew Doyle, Rajiv Jham, Andrew Rudolph, Brian Silberberg, Aisha Ayoub, Edward Huerta, and William Baltazar, “Name of Robot: RACE/Lightening - Robotic And Creative Engineering (RACE),” Dr. Michael M. Krop Senior High School, Miami.

14:55 – 15:10

M. R. Moore, T. A. Choi, E. M. Schwartz, M. C. Nechyba, and A. A. Arroyo, “Creation and Analysis of Sensory Drivers Using ERL,” University of Florida, Gainesville.

15:15 – 15:30

L. Li, W.Y. Bao, and I. N. Tansel, “Evaluation of Tool Conditions by using Genetic Algorithms,” Florida International University, Miami.

### **3 Vision, Sensing and Control**

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**16:10 – 17:45 Thursday, May 23, GC 243West**

**Session Chairs:      Dr. Antonio Arroyo, UF Gainesville  
                                 Dr. Armando Barreto, FIU Miami**

16:10 – 16:25

D. Novick, C. Crane, and D. Armstrong, “Implementation of a Sensor Fusion Base Object Detection Component for an Autonomous Outdoor Vehicle,” University of Florida, Gainesville.

16:30 – 16:45


F. M. Candocia, “Synthesizing a Panoramic Scene with a Common Exposure via the Simultaneous Registration of Images,” Florida International University, Miami.

16:50 – 17:05

M. Choudhury, and A. Barreto, “Omni-directional Range-finding Sonar System for Human Navigation,” Florida International University, Miami.

17:10 – 17:25

S. Ettinger, M. C. Nechyba, P. Ifju, and M. Waszak, “Vision-Guided Flight Stability and Control for Micro Air Vehicles,” University of Florida, Gainesville.



17:30 – 17:45

P. Vinch, C. Crane, and D. Armstrong, “Intelligent Vehicle Controller Development,” University of Florida, Gainesville.

## **4A Mechanisms**

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**9:00 – 10:30 Friday, May 24, GC 243 West**

**Session Chairs:**      **Dr. Zvi Roth, FAU Boca Raton**  
                                 **Dr. Carl Crane, UF Gainesville**

9:00 – 9:15

Y. H. Oh, and G. J. Wiens, “Parameter Sensitivity in Sensor Location of Parallel Kinematic Mechanisms,” University of Florida, Gainesville.

9:20 – 9:35

P. Larochelle, and A. Agius, “A Study of the Coupler Surfaces of the Spatial 4C Mechanism,” Florida Institute of Technology, Melbourne.

9:40 – 9:45

Melissa Rogers, Thomas J. Kelly, John D. Morris II, Bonnie Landon, Denise Martin, Logan Rainard, Wayne Krug, “Fledgling: The Story of FAU’s First Six-Legged Owl,” Florida Atlantic University, Boca Raton.

9:50 – 10:05

R. G. Roberts, T. A. Shirey, and E. Fabre, “A New Procedure for Realizing a Positive Definite Spatial Stiffness Matrix with a Parallel Connection of Simple Springs,” Florida State University – Florida Agriculture and Mechanics University, Tallahassee.

10:10 – 10:25

A. Hinson, S. Yerluri, and C. Crane, “Feature and Landmark Based Position Systems,” University of Florida, Gainesville.

## **4B Design**


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**9:00 – 10:30 Friday, May 24, GC 241A**

**Session Chairs:**      **Dr. Hanqi Zhuang, FAU Boca Raton**  
                                 **Dr. Rajiv Dubey, USF Tampa**

9:00 – 9:15

M. Grimm, A. A. Arroyo, and M. C. Nechyba, “Thing: A Robotic Hand with Realistic Thumb Pronation,” University of Florida, Gainesville.



9:20 – 9:35

J. Plew, A. A. Arroyo, and E. M. Schwartz, “Applying an Evolvable Hardware Approach to Autonomous Robot Design,” University of Florida, Gainesville.

9:40 – 9:45

Everett Henderson, Oscar Castillo, Braque Matheson, Wesley Thigpen, Arthur Anconetani, Heui-Hsin Chen, David Anconetani, Anderson Prewitt, Ephaulin Leeks, Ernestine Lowery, Andrew Otete, Darius Woodford, “Team R.A.T. (Robot Annihilation Team),” FAMU/FSU, Tallahassee.

9:50 – 10:05

B. Ozelik, and F. Erzincanli, “End-Effector Design for Lifting of Fabrics One-by-One from a Stack in the Textile Sector,” Gebze Institute of Technology, Gebze-Kocaeli, Turkey.

10:10 – 10:25

E. Mebarak, and S. Tosunoglu, “Optimal Design of a Robotic System via the Automated Integration of MatLab and Pro/Engineer Software Tools,” Florida International University, Miami.

## **5A Teleoperation Systems and Human-Machine Interface**

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**10:45 – 12:25 Friday, May 24, GC 243 West**

**Session Chairs:**      **Dr. Pierre Larochelle, FIT Melbourne**  
                                 **Dr. Gloria Wiens, UF Gainesville**

10:45 – 11:00

M. Alonso Jr., F. Perez, and A. Barreto, “On-screen Pre-deblurring of Images to Enhance the Interaction Between Computers and Low-Vision Users,” Florida International University, Miami.

11:05 – 11:20

E. Al-Masri, and A. Barreto, “A Practical System for Hands-Off Computer Interaction Based on EMG/Eye Gaze Tracking,” Florida International University, Miami.

11:25 – 11:40

B. Fritz, W. Yu, N. Pernalet, M. Jurczyk, and R. Dubey, “Enhancing the Manipulation Capabilities of Persons with Disabilities Using Sensor Assisted Teleoperation,” University of South Florida, Tampa.

11:45 – 12:00

C. Chesney, and C. Crane, “Development of a Planar Force-Feedback Input Device Using Hybrid Active/Passive Actuation,” University of Florida, Gainesville.

12:05 – 12:20

P. D. O'Malley, M. C. Nechyba, and A. A. Arroyo, "Human Activity Tracking for Wide-Area Surveillance," University of Florida, Gainesville.

## 5B Applications

10:45 – 12:25 Friday, May 24, GC 241A

**Session Chairs:**      **Dr. Laura Pullum, FIU Miami**  
                                 **Dr. Eric Crumpler, FIU Miami**

10:45 – 11:00

D. MacArthur, and C. Crane, "Development of an Ultrasonic Positioning System for Multiple Vehicle Control," University of Florida, Gainesville.

11:05 – 11:20

U. Rodriguez, J. Buisson, L. Miller, R. Panez, and E. M. Schwartz, "An Autonomous Pong Playing Robot," University of Florida, Gainesville.

11:25 – 11:40

D. J. Cox\*, B. Mooring\*\*, and J. D. Crine\*\*\*, "Experiments in Dynamic Alignment with Semiconductor Wafer Material Handling Robot," The University of North Florida\*, Jacksonville, Lam Research Corporation\*\*, Austin Texas, The University of Texas at Austin\*\*\*, Austin Texas.

11:45 – 12:00

D. Raviv, "Do we teach them how to think?" Florida Atlantic University, Boca Raton.

12:05 – 12:20

S. Korula, and S. Tosunoglu, "Web-Based TeleRobot Technologies," Florida International University, Miami.

