Maria Isabel Restrepo

School of Engineering
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Research Focus

Computer vision and machine learning with an emphasis on understanding the three-dimensional world. Probabilistic image-based modeling, 3-d object recognition, 3-d feature description, compositional learning, 3-d surface reconstruction, and 3-d registration.

Education

Brown University - Providence, RI. USA
Ph.D Student Computer Vision. School of Engineering, 2006-present.
Ph.D Advisor: Prof. Joseph L. Mundy
Ph.D Thesis: Characterization of Probabilistic Volumetric Models for 3-d Computer Vision (defended April 19, 2013).
Ph.D Thesis Committee: Dr. Joseph Mundy, Dr. Gabriel Taubin, Dr. Pedro Felzenszwalb and Dr. Radu Rusu

Brown University - Providence, RI. USA
M.S degree in Applied Mathematics, May 2009.
Course work focused on Probability Theory.

Trinity College, Hartford, CT. USA
B.S with Honors Electrical Engineering, May 2006
Advisor: David Ahlgren
Thesis: Design of a Color Meter

Experience

Brown University - Providence, RI. USA

Research Assistant - 2006-present
Research assistant and software developer for Computer Vision applications under the guidance of Professor Joseph Mundy.

Instructor: Summer Course "Do you Want to be an Engineer" - 2010
Co-instructor of a three-week pre-college course where students are introduced to the different areas of engineering

Teaching Assistant: Scientific Programming in c++ - 2008
Teaching Assistant for graduate level course. Held help sessions and graded c++ homework projects

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Trinity College - Hartford, CT. USA

Research Assistant - Howard Hughes Medical Institute (HHMI)
Developed a micro controller system to collect and classify respiratory signals from young adults. Using fuzzy logic, respiratory signals were classified as normal, respiration with artifacts or apnea. This research was conducted under the guidance of Prof. Taikang Ning.

Teaching Assistant: Introduction to Engineering Design - 2005-2006
Under the guidance of Prof. David Ahlgren, helped undergraduate students design fire-fighting robots. Held weekly lab sessions where students were introduced to basic electrical, mechanical and programming challenges behind robotics.

Residential Assistant - 2003-2006
Helped community development by planning activities within the residence halls, providing peer advice, and general assistance with community living matters.

Co-Chief Engineer, Robot Study Team. Engineering Department - 2006
Helped directing and guiding a group of electrical, mechanical and computer engineers to design and build autonomous robots. Under the guidance of Prof. David Ahlgren, this group competed at the Trinity Fire-Fighting Contest and at the DARPA-AUVIS Intelligent Ground Vehicle Competition (IGVC)

Captain of Trinity Women's Squash Team - 2006
Conducted team practices. Provided athletic and personal support, guidance and inspiration to the team members.

Publications

Calakli, F., A. O. Ulusoy, M. I. Restrepo, J. L. Mundy, and G. Taubin, High Resolution Surface Reconstruction from Multi-view Aerial Imagery. 3D Imaging Modeling Processing Visualization Transmission (3DIMPVT), 2012.

Restrepo, M.I, Mundy, J.L. An Evaluation of Local Descriptors for Object Categorization in Probabilistic Volumetric Scenes. British Machine Vision Conference (BMVC) 2012.

Restrepo, M.I, Mayer, B.A, Ulusoy, A.O. and Mundy, J.L. Characterization of 3-d Volumetric Probabilistic Scenes for Object Recognition. Journal of Selected Topics in Signal Processing issue Emerging Techniques in 3-D. 2012.

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Restrepo, M.I, Mayer, B.A, and Mundy, J.L. Object Recognition in Probabilistic 3D Volumetric Scenes. International Conference of Pattern Recognition Application and Methods (ICPRAM) 2012

Restrepo, M.I, Bhandari, S, and Ning T. Classification of respiration episodes using fuzzy logic. IEEE Bioengineering conference 2006

Bhandari, S. and Mathis, A. and Mohiuddin, K. and Pietrocola, D. and Restrepo, M. and Ahlgren, D.J. Autonomous robot navigation using vision-and sensor-based algorithm. Proceedeing of SPIE 2006

Honors/Awards

Phi Beta Kappa Society - 2006
Academic Honor Society

NCAA Winter Postgraduate Scholarship - 2006
Award granted to top student/athletes in intercollegiate athletics. First squash player to receive award and first female awardee at Trinity College

Trinity Susan A. Martin Award - 2006
“Outstanding Student-Athlete" Award presented annually to the senior woman who combined excellence on the fields of competition with excellence in the classroom.

President’s Fellow in Engineering at Trinity College- 2005-06
Awarded to the top student in Engineering. President Fellows meet with the president of the college and faculty to discuss topics of interest.

New England Small College Athletic Conference All-Academic honor - 2002-2006

Research Activities

Software Development:
Developer, VXL - Computer Vision Libraries - 2002-present.
User, Point Cloud Library (PCL), Visualization Toolkit (VTK), QT, OpenCV
Committees:
Member, Trinity College Engineering Advisory Committee (TEAC)- 2007-2008
Judge, Robotics Park Event, East Providence, RI - 2009

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Technical Expertise

Programming: C++, C, Python, OpenCL, Matlab, CMake, LabView
Platforms: Mac OSX, Linux, Windows
Languages: Spanish and English.

Other Interests

Squash Player - Part of Colombia's National Team 1999-2007
Traveling, biking, sailing and yoga.

References

Prof. Joseph L. Mundy - Brown University, Providence, RI. USA
mundy@lems.brown.edu

Prof. Gabriel Taubin - Brown University, Providence, RI. USA
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Dr. Radu B. Rusu - Open Perception Inc.
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