

# Robert Tamburo, Ph.D.

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## OBJECTIVE

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Intelligent, motivated research engineer with a proven track record of creative problem solving and mastering new technologies seeks a growth position in a research and development setting.

## EDUCATION

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### UNIVERSITY OF PITTSBURGH

May 2006      Doctor of Philosophy in Bioengineering, Signals and Imaging Concentration  
Dissertation Title: *Feature-Based Correspondences to Infer the Location of Anatomical Landmarks*

Dec. 2002      Master of Science in Bioengineering, Signals and Imaging Concentration  
Thesis Title: *Gradient-Oriented Boundary Profiles for Shape Analysis Using Medial Features*

### DELAWARE STATE UNIVERSITY

May 1999      Dual Bachelor of Science in Physics with Engineering Emphasis and Mathematics

## RESEARCH EXPERIENCE

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### CARNEGIE MELLON UNIVERSITY

#### Project Scientist

September 2011 – Present

- Lead engineer for the development of a new automotive headlight design ([cs.cmu.edu/~ILIM/SmartHeadlight](http://cs.cmu.edu/~ILIM/SmartHeadlight))
  - Developed high-speed, low-latency software and hardware for prototype of headlight design (OpenCV, IPP, TBB)
  - Design and conducted experiments to demonstrate effectiveness of the design
  - Performed multiple demonstrations for academia, industry, and media
  - Worked closely with industry partners (Intel Labs) and supervised students involved with the project on a daily basis

### INTEL LABS PITTSBURGH

#### Research Fellow

May 2010 – August 2011

- Developed and implemented computational algorithms (C++) for detecting anatomical features and features indicative of diabetic retinopathy in fundus images
  - Worked with a local Optometrist and an international Ophthalmologist to define and refine clinical indicators
  - Participated in process definition and team management for algorithm development and testing
  - Coordinated research efforts with interstate team member
- Designed and developed a web-based application (HTML5, CSS, PHP, Javascript) to facilitate the annotation of images
  - Designed user interface for clinicians and adapted the GUI to their changing needs
  - Incorporated mechanism for image transfer and submission of clinical reports
  - Managed and organized data for secure storage and transmission
  - Created real-time demonstration with non-mydriatic fundus camera for lab open house

### UNIVERSITY OF PITTSBURGH MEDICAL CENTER

#### Research Principal

2009 –2010

- Led project for studying structural and functional brain changes in HIV and drug abuse under hypercapnic conditions
  - Created imaging protocol for acquiring BOLD and ASL functional MRI images
  - Designed experimental study for determining optimal ASL sequence parameters
  - Developed image processing pipelines for analyzing BOLD, ASL, MPRAGE, and DTI MRI images (ITK, Matlab)
  - Designed and constructed hardware for delivering medical grade air or air with 5% CO<sub>2</sub> to study participant
  - Supervised acquisition of MRI images during scan at medical center

- Developed a method for localizing amygdalar structural differences in late-life depression
  - Implemented methods (in C++) for tessellating surfaces, determining point correspondences, and computing surface-based statistics
  - Designed an application to visualize (VTK and FLTK) and compare surface models
  - Developed software for performing real-time fMRI (BOLD) analysis
  - Implemented methods for computing BOLD activity within an image ROI as acquired
  - Provided graphical display for study participant as cue to increase or decrease emotional task
  - Conducted study for systematically assessing amygdalar size normalization strategies for volumetric analysis

## TECHNICAL SKILLS

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- Operating Systems: Microsoft Windows, Mac OSX, Linux (Ubuntu)
- Programming Skills: C/C++, HTML, HTML5, CSS, LaTeX, PHP, Javascript, Shell Scripting
- Toolkits/Tools: ITK, VTK, FLTK, CMake, CVS, SVN, Doxygen, TBB, IPP
- Image Analysis Tools: SPM, AFNI, FSL, AIR, ImageJ, OsiriX, Slicer, ITK-SNAP, MIPAV, OpenCV
- Development Environments: Matlab, MS Visual Studio, Borland, Cygwin, MinGW, GCC
- Other: MS Office Suite, Acrobat, Photoshop, Illustrator, EndNote, SPSS, JMP

## PROFESSIONAL INVOLVEMENT

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- Internal grant review and reviewer for scientific conferences and journals
- Institute of Electrical and Electronics Engineers (IEEE) Membership (2007 - 2009)
- IEEE Engineering in Medicine and Biology Society Membership (2007 - 2009)
- Engineers for a Sustainable World National and University of Pittsburgh Chapter Membership (2006 - 2007)

## AWARDS/ACHIEVEMENTS

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- 10 Most Promising Technologies – Car and Driver (2013)
- Summer Research Institute in Geriatric Psychiatry (2007)
- National Institutes of Mental Health Post-Doctoral Fellowship (2006)
- School of Engineering Outstanding Teaching Assistant Award (2002)

## SELECTED PUBLICATIONS

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**Robert Tamburo**, Eriko Nurvitadhi, Abhishek Chugh, Mei Chen, Anthony Rowe, Takeo Kanade, Srinivasa G. Narasimhan. Programmable Automotive Headlights. European Conference on Computer Vision. 2014. *Accepted as Oral Presentation.*

Raoul de Charette, **Robert Tamburo**, Peter Barnum, Anthony Rowe, Takeo Kanade and Srinivasa G. Narasimhan. Fast Reactive Illumination through Rain and Snow. IEEE International Conference on Computational Photography (ICCP), April 2012. *Best Paper Honorable Mention Award.*

**Robert Tamburo**, Srinivasa G. Narasimhan, Anthony Rowe, Takeo Kanade, Eriko Nurvitadhi, Mei Chen. DMDs for Smart Headlights. Emerging Digital Micromirror Device Based Systems and Applications VI, SPIE 2014. *Invited Talk and Paper.*

**R. J Tamburo**, S.-G. Kim, T. J. Hupper t, A. B. Douaihy, D. M. Martineck, H. J. Aizenstein, J. T. Becker. Cerebral Vascular Response to Hypercapnia for Middle-Aged Males with HIV. Human Brain Mapping, Barcelona, Spain. 2010.

**R. J Tamburo**, S.-G. Kim, A. B. Douaihy, J. T. Becker. Cerebral Blood Flow as a Function of PASL Imaging Parameters. Human Brain Mapping, Barcelona, Spain. 2010.

**R. J. Tamburo**, G. J. Siegle, G. D. Stetten, C. A. Cois, M. A. Butters, and H. J. Aizensten. Amygdalae Morphometry in Late-Life Depression. International Journal of Geriatric Psychiatry, 24(8):837-846, 2009.