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## Owen Carmichael

### *Curriculum Vitae*

#### Research Interests

Brain imaging, late-life cognitive decline, and image processing methodology.

#### Education

- 1997 - 2003     **Carnegie Mellon University, Pittsburgh, PA.**  
Ph.D. in Robotics, December 2003.  
Thesis: *Discriminative Techniques For The Recognition of Complex-Shaped Objects*  
Committee: Martial Hebert (chair), Henry Schneiderman, Jianbo Shi, Tom Minka, Yann LeCun.
- 1993 - 1997     **University Of California, Berkeley, CA.**  
B.S. with Honors in Electrical Engineering And Computer Science, May 1997.

#### Employment

- 2014-current     **Pennington Biomedical Research Center, Baton Rouge, LA.**  
Associate Professor and Director of the Biomedical Imaging Center.
- 2005-2014     **Neurology Department, University of California, Davis, CA.**  
Associate Professor (100% appointment). Promoted from Assistant to Associate level in 2012.
- 2006-2014     **Computer Science Department, University of California, Davis, CA.**  
Associate Professor (0% appointment). Promoted from Assistant to Associate level in 2012.
- 2003-2005     **Radiology Department, University of Pittsburgh, Pittsburgh, PA.**  
Postdoctoral scholar studying image analysis algorithms for Alzheimer's Disease.  
Advisors: Carolyn Meltzer, Yanxi Liu, Oscar Lopez, Jim Becker, Howard Aizenstein
- Winter 1999     **Minolta Corporation, Osaka, Japan.**  
Developed tools for automatic recognition of human faces from 3D range data.  
Advisor: Eiro Fujii

## Employment (continued)

- Summer 1999     **Mitsubishi Electric Research Laboratory, Cambridge, MA.**  
Implemented techniques for super-resolution of blurred images.  
Advisor: Bill Freeman
- Summer 1998     **K2T Corporation, Pittsburgh, PA.**  
Consulted for demonstration of 3D modeling tools for corporate clients.  
Advisor: Eric Hoffman
- 1996 - 1997     **IBM Almaden Research Laboratory, San Jose, CA.**  
Investigated edge-based approaches to content-based image retrieval.  
Advisor: Myron Flickner
- Fall 1996        **DBStar Inc., San Francisco, CA.**  
Developed new algorithms for quick discovery of causal rules in relational databases.  
Advisor: Bill Franklin
- 1995 - 1996     **Electronic Research Laboratory, University Of California, Berkeley, CA.**  
Developed and programmed a parallel version of a lithography simulation software package.  
Advisor: Andrew Neureuther

## Grant Support

- 2001 - 2016     **U. C. Davis Alzheimers Disease Core Center (NIH/NIA, P30 AG010129, C. DeCarli PI)**  
Major goals of this project are to enroll, study and follow a cohort of patients and control subjects who are thoroughly characterized, and longitudinally followed to autopsy. This provides a research infrastructure for clinical and basic studies of dementia in Northern California. **Role:** I am Associate Director of the Neuroimaging Core, responsible for validating and improving neuroimaging data collection for the Center.
- 2005 - 2012     **Alzheimers Disease Neuroimaging Initiative (NIH/NIA, U01 AG024904, M. Weiner PI)**  
The goals of this project are to perform analysis of abnormal white matter signals and stroke on subjects with normal cognition, MCI, and mild AD longitudinally followed for 3 years. These data will be combined with other data as a public resource for research on biological markers for early diagnosis and longitudinal evaluation of patients with AD. **Role:** I oversee calculation of white matter hyperintensities, tissue volumes, cranial vault segmentations, and infarct ratings on all ADNI MRI scans.

## Grant Support (continued)

- 2007 2008 **Novel Hippocampal Morphometrics for Quantification of AD Structural Correlates (UC Davis Alzheimer's Disease Center and Clinical Translational Sciences Center, O. Carmichael PI)**  
The goal of this pilot project is to explore the viability of a novel spatial morphometry measure for analysis of hippocampi from the University of California, Davis Alzheimers Disease Center (UCD ADC). Sensitivity and specificity of the novel morphometric measure for prediction of AD in the UCD ADC will be evaluated. **Role:** I provided leadership and data analysis for this project.
- 2007 2012 **Predictors of Alzheimers Disease in Mild Cognitive Impairment (NIH/NIA, R01AG20098, O. L. Lopez PI)**  
The purpose of this final renewal of the Pittsburgh Cardiovascular Health Study Cognition Study is to determine risk of dementia among cognitively normal participants and individuals with MCI using MRI measures of brain structural integrity and cerebral perfusion as well as cognitive function, cardiovascular health, genetic characteristics, and other risk factors. **Role:** I am contributing to analyses that relate brain MRI measures to risk of dementia, death, and ancillary clinical variables related to physical and vascular health.
- 2008 2009 **Larry L. Hillblom Network for Cognitive Neuroscience of Diabetes, Aging and Memory (Larry L. Hillblom Foundation, C. DeCarli PI)**  
The goal of this study was to understand how diabetes effects memory using structural and functional brain imaging and evoked response potentials to examine biological brain changes so that physicians can provide informed treatment and prevention recommendations for seniors and the population as a whole. **Role:** I supported neuroimaging data analyses for this project.
- 2008 2013 **Aging Brain: Vasculature, Ischemia and Behavior (NIH/NIA, P01 AG 012435, H. Chui PI)**  
The major goal of this project is to determine how structural changes in the cerebral vasculature affect brain function and behavior in elderly persons. **Role:** I oversee MRI data collection at UC Davis for this project.
- 2008 2013 **MR Morphometrics and Cognitive Decline Rate in Large-Scale Aging Studies (NIH/NIA , K01 AG030514, O. Carmichael PI)**  
The purpose of this study is to perform research and career development activities related to the neuroanatomical changes that occur during the course of late-life cognitive decline. **Role:** I am the principal investigator of this grant.
- 2008 2009 **Sex Hormones and Cerebral Imaging in Cognitive Dysfunction (UC Davis Alzheimers Disease Center Pilot Grant, Jennifer Lee PI)**  
The major goals of this project were to quantify serum levels of sex hormone in a diverse cohort of community-dwelling elderly individuals and to relate sex hormone levels to MRI measures of brain structure. **Role:** I performed neuroimaging data analyses for this project.

## Grant Support (continued)

- 2009-2012 **Novel MRI-Based Hippocampal Markers for Alzheimers Disease (Dana Foundation, O. Carmichael PI)**  
The major goals of this study were to adapt a novel MRI-based morphometric measure of hippocampal atrophy to a large-scale elderly neuroimaging cohort and assess associations between the measure and cognitive decline. **Role:** Principal Investigator.
- 2011-2014 **Shape Differences in the Biological Sciences (NSF/IIS, 1117663, N. Amenta PI)**  
The major goals of this project are to develop the mathematical, statistical, and computational methods required to establish anatomical correspondences among groups of biological specimens, and to apply the methods to primate skull fossils, human brain regions, and molecular surface models. **Role:** As co-PI, I provide human brain shape data based on brain MRI, as well as neuroscience expertise, that help drive development of correspondence algorithms.
- 2010-2012 **SME: Guided Learning in Dynamic Environments (Office of Naval Research, I. Davidson, PI)**  
The major goal of the grant is to develop machine learning algorithms for classification, clustering, and other problems that increase their usefulness with experience and expert user input. Applications of interest include classification and clustering of functional MRI data in various clinically-relevant tasks with input from domain expert neuroscientists. **Role:** I provide functional brain MRI data and domain expertise in neuroscience for this grant.
- 2012-2015 **RTG: Statistics in the 21st Century - Objects, Geometry and Computing (NSF/DMS and MPS - 1148643, W. Polonik, PI)**  
The project provides training to statistics graduate students in dealing with images, matrices, functions, trajectories, trees, graphs, and related objects in statistical analysis. This will prepare students and postdocs for more advanced studies and research activities in Statistics and the mathematical sciences in general **Role:** As Senior Personnel, I provide neuroimaging mentorship and data to student trainees applying advanced statistical estimation techniques to the neuroimaging data.
- 2012-2015 **Multidimensional Curve Estimation for Diffusion MRI (NSF/DMS, 1208917, O. Carmichael, PI)**  
The major goal of this project is to develop mathematically rigorous methods for tracing fiber tract trajectories in high angular resolution diffusion MRI. This is a collaborative proposal with DMS 1208238 (L. Sakhanenko, PI). **Role:** I am principal investigator of this grant.
- 2012-2015 **Statistical Representations and Algorithms for Brain Connectivity (NSF/DMS, 1228369, H. Mueller, PI)**  
The major goal of this project is to develop the statistical theory and quantitative algorithms necessary to allow robust quantification of inter-regional brain connectivity from functional magnetic resonance imagery. **Role:** As Co-PI of this project, I provide neuroimaging data and neuroscience expertise required to develop relevant statistical methods for brain connectivity.

## Grant Support (continued)

- 2009-2014 **Visuospatial Cognitive Deficit in Del22q11.2 Syndrome (NIH/NICHHD, RO1 HD042971, T. Simon, PI)**  
The goal of this project is to investigate the hypothesis that the characteristic visuospatial and numerical deficits in this disorder derive from inferior parietal lobe dysfunction. **Role:** As a co-investigator, I lead computational analyses of MRI data, including regional hippocampus shape analysis and automated segmentation of relevant brain regions.
- 2013-2015 **Imaging Biomarkers of Preclinical Cerebrovascular Disease (Alzheimer's Association, O. Carmichael, PI)**  
The aim of this study is to assess relationships among MRI markers of cerebrovascular disease and neuronal injury among healthy elderly individuals whose brain amyloid status has been determined through PET imaging with the amyloid-binding agent florbetapir. **Role:** Principal Investigator.
- 2013-2016 **Determinants and Consequences of White Matter Degeneration in Alzheimers Disease (California State Alzheimer's Disease Research Program, O. Carmichael, PI)**  
The aim of this study is to assess relationships among Alzheimer pathology, longitudinal white matter degeneration and gray matter atrophy from MRI imaging, and cognitive function in the Alzheimer's Disease Neuroimaging Initiative. This is a consortium award with UCSF and UCLA. **Role:** Principal Investigator.

## Teaching And Mentoring Experience

### Master's Thesis Committees at UC Davis

- Leonid Shamis Computer Science Graduate Group. **Thesis topic:** Constraint Based Framework for Optimal k-Clustering. **Thesis advisor:** Ian Davidson.
- Vladimir Glavtchev Computer Engineering Graduate Group. **Thesis topic:** Using graphics processing units to detect road signage from video sequences. **Thesis advisor:** John Owens.
- Karl Beutner Applied Mathematics Graduate Group. **Thesis topic:** Uncertainty estimation in MRI-based brain region segmentation. **Thesis advisor:** Owen Carmichael.

### PhD Dissertation and Qualifying Exam Committees at UC Davis

- Tom Kuo Computer Science Graduate Group. **Thesis topic:** Data mining methods for network discovery. **Thesis advisor:** Ian Davidson.
- Yang Zhou Statistics Graduate Group. **Thesis topic:** Covariance estimation in spatio-temporal processes. **Thesis advisor:** Jane-Ling Wang.
- Lin Zheng Computer Science Graduate Group. **Thesis topic:** Multi-modal medical image volume visualization. **Thesis advisor:** Kwan-Liu Ma.

## Teaching And Mentoring Experience (continued)

Yuanfeng Zhu	Computer Science Graduate Group. <b>Thesis topic:</b> Real time simulation of interactive motion. <b>Thesis advisor:</b> Michael Neff.
Sean Gilpin	Computer Science Graduate Group. <b>Thesis topic:</b> Tensor decomposition with constraints. <b>Thesis advisor:</b> Ian Davidson.
Buyue Qian	Computer Science Graduate Group. <b>Thesis topic:</b> Active transfer learning. <b>Thesis advisor:</b> Ian Davidson.
Andrea Quintero	Neuroscience Graduate Group. <b>Thesis topic:</b> Visuospatial attention in three neurodevelopmental disorders. <b>Thesis advisor:</b> Tony Simon.
Yingying Wang	Computer Science Graduate Group. <b>Thesis topic:</b> Perception and Synthesis of Conversational Gestures for Virtual Characters. <b>Thesis advisor:</b> Michael Neff.
Ryan James	Physics Graduate Group. <b>Thesis topic:</b> Efficient estimation of the synchronization properties of computational mechanics models. <b>Thesis advisor:</b> Jim Crutchfield.
Maria Gonzalez	Electrical Engineering Graduate Group. <b>Thesis topic:</b> Electrical engineering applications of prolate spheroidal wave functions. <b>Thesis advisor:</b> Hong Xiao.
Chun-Jung Huang	Biostatistics Graduate Group. <b>Thesis topic:</b> Statistical summaries of large-scale neuroimaging data. <b>Thesis advisor:</b> Danielle Harvey.
Christopher Schwarz	Computer Science Graduate Group. <b>Thesis topic:</b> Markov random field simplification via link removal. <b>Thesis advisor:</b> Owen Carmichael.
Bess-Carolina Dolmo	Biomedical Engineering Graduate Group. <b>Thesis topic:</b> Point-based representation methods for cortical surface analysis. <b>Thesis advisor:</b> Owen Carmichael.
Samuel Lockhart	Neuroscience Graduate Group. <b>Thesis topic:</b> White matter integrity, functional connectivity, and executive control in aging. <b>Thesis advisor:</b> Charles DeCarli.
Anna Tikhonova	Computer Science Graduate Group. <b>Thesis topic:</b> Visualizing large, complex data sets. <b>Thesis advisor:</b> Kwan-Liu Ma.
Fatemeh Abbasinejad	Computer Science Graduate Group. <b>Thesis topic:</b> Shape matching of proteins using accelerated graphics cards.. <b>Thesis advisor:</b> Nina Amenta.
Xiang Wang	Computer Science Graduate Group. <b>Thesis topic:</b> Clustering, learning, and ranking in complex graphs. <b>Thesis advisor:</b> Ian Davidson.
Jun Chen	Statistics Graduate Group. <b>Thesis topic:</b> Smoothing and regression on Riemannian manifolds. Thesis advisors: Debashis Paul and Jie Peng.

## Teaching And Mentoring Experience (continued)

Jing Xie	Computer Science Graduate Group. <b>Thesis topic:</b> Shape analysis of brain regions from imaging data. <b>Thesis advisor:</b> Owen Carmichael.
Deboshmita Ghosh	Computer Science Graduate Group. <b>Thesis topic:</b> Automated landmark placement on biomedical shape models. <b>Thesis advisor:</b> Nina Amenta.
Jinxiu Liao	Biomedical Engineering Graduate Group. <b>Thesis topic:</b> Automated segmentation and reconstruction of positron emission tomography images. <b>Thesis advisor:</b> Jinyi Qi.
Blake Hunter	Applied Mathematics Graduate Group. <b>Thesis topic:</b> Sparse feature selection in high-dimensional data sets. <b>Thesis advisor:</b> Thomas Strohmer.
Mauricio Hess-Flores	Computer Science Graduate Group. <b>Thesis topic:</b> Recovering 3D scene structure from aerial photographs. <b>Thesis advisor:</b> Ken Joy.
Ernest Woei	Applied Mathematics Graduate Group. <b>Thesis topic:</b> Heat diffusion methods for shape description and classification. <b>Thesis advisor:</b> Naoki Saito.
Lin Fu	Biomedical Engineering Graduate Group. <b>Thesis topic:</b> Iterative reconstruction of positron emission tomography images. <b>Thesis advisor:</b> Jinyi Qi.
Zijie Qi	Computer Science Graduate Group. <b>Thesis topic:</b> Data mining with constraints. <b>Thesis advisor:</b> Ian Davidson.
Pengcheng Luo	Computer Science Graduate Group. <b>Thesis topic:</b> Character animation based on motion capture data. <b>Thesis advisor:</b> Michael Neff.

## Courses at UC Davis

RTG	Series of lectures on neuroimaging for the NSF-funded Research Training Group on Objects, Geometry, and Computing in Fall 2013.
HDE 117	"Meet The Scientists" guest lecture for HDE 117, "Longevity," November 7, 2012.
PSC 263	Created PSC 263, "Cognitive Neuroscience of Aging;" Instructor of record for PSC 263 in Spring Quarter 2012 (Overall rating was "Excellent" on 7 / 8 student evaluations).
ECS 173	Instructor of Record for ECS 173 (formerly ECS 189H) Spring Quarter 2009 (Average student evaluation score: 9.33 / 10), Fall Quarter 2010 (9.1 / 10), Spring 2013 (9.1 / 10).

## Teaching And Mentoring Experience (continued)

ECS 289H	Created ECS 289H, "Advanced Image Processing and Analysis;" Instructor of record for ECS 289H in Spring Quarter 2008, (Average student evaluation score: 9.5 / 10), Fall Quarter 2009 (9.75 / 10), Winter Quarter 2012 (10/10).
STA 280	Co-Instructor of record for STA 280, "Introduction to Functional Data Analysis and Representations of Brain Connectivity" (with Hans Mueller and Jane-Ling Wang), Fall 2013
Lecture for residents	Lecturer on MRI techniques for UC Davis Neurology Residency Program didactic course, 9/6/2007.
Journal Club	Periodic guest faculty for Neuroimaging Journal Club, 2006-2013
Independent study	Instructor of Record for three independent study projects in computer science (CS 199), two in neuroscience (NEU 199), and one in biomedical engineering (BME 199).
ECS 189H	Created ECS 189H, "Introduction To Image Processing and Analysis;" Instructor of record for ECS 189H in Winter Quarter 2007. (Average student evaluation score: 9.75 / 10)

## Student Mentoring at the UC Davis

Julia Scott	(Postdoctoral fellow, Neuroscience) <b>Research topic:</b> Relationships between biomarkers of Alzheimer's disease neuropathology, white matter and gray matter markers, and cognitive decline.
Casey Wilson	(B.S. student, Computer Science) <b>Research topic:</b> Automated matching of 3D surfaces of the human face. <b>Research product:</b> Software system for 3D matching of face surfaces.
Melissa Chenok	(B.A. student, Neuroscience, Smith College) <b>Research topic:</b> Reliability of protocols for tracing sulci on human brain surfaces.
Jessica Liu	(B.S. student, Neurobiology, Physiology, and Behavior) <b>Research topic:</b> Protocols for tracing sulci on human brain surfaces. <b>Research product:</b> One manuscript in Prized Writing undergraduate journal.
Devin Fenton	(B.S. student, Neurobiology, Physiology, and Behavior) <b>Research topic:</b> Mathematical complexity of sulcal curves on the aging brain. <b>Research product:</b> One Undergraduate Research Conference presentation.
Chris Patton	(B.S. student, Computer Science) <b>Research topic:</b> Detecting salamanders in video feeds for conservation ecology research. <b>Research product:</b> One Undergraduate Research Conference presentation.



## Teaching And Mentoring Experience (continued)

Varsha Viswanath	(B.S. student, Biomedical Engineering) <b>Research topic:</b> Noise removal from diffusion MRI data. <b>Research products:</b> One manuscript.
Alex Tsui	(Ph.D. student, Computer Science) <b>Research topic:</b> Geometric correspondences between MRI-based brain surfaces. <b>Research products:</b> Two published manuscripts.
Phong Vuong	(Ph.D. student, Computer Science) <b>Research topic:</b> Assessment of uncertainty in brain region delineations. <b>Research products:</b> One published manuscript.
Kristopher Kalish	(Ph.D. student, Computer Science) <b>Research topic:</b> Point-based surface methods applied to neuroimaging shape analysis and segmentation.
Lovingly Quitania Park	(Postdoctoral fellow, Neuropsychology) <b>Research topic:</b> Relationships between cognitive decline, neuropsychiatric symptoms, and brain anatomy in aging. <b>Primary mentor:</b> Sarah Farias.
Qiang Wang	(Postdoctoral fellow, Mathematics) <b>Research topic:</b> Statistics on populations of mouse brain MRIs. <b>Co-mentor:</b> Rob Berman. <b>Current position:</b> Product development engineer, Aaken Lab, Woodland, CA.
Brian Alger	(M.S. student, Applied Math) <b>Research topic:</b> Automated brain region segmentation from MRI.
Jagadeesh Pakaravoor	(Ph.D. student, Computer Science) <b>Research topic:</b> Automated alignment of brain regions in MRI.
Karl Beutner	(M.S. student, Applied Math) <b>Research topic:</b> Automated segmentation of human brain regions. <b>Research products:</b> One manuscript and master's thesis.
Jing Xie	(Ph.D. student, Computer Science) <b>Research topic:</b> Intuitive parameterization of ensembles of biological shapes. <b>Research products:</b> Four manuscripts.
Chris Schwarz	(Ph.D. student, Computer Science) <b>Research topic:</b> Automated detection of white matter lesions in structural MR images of the brain. <b>Research products:</b> Three manuscripts. <b>Current status:</b> Postdoctoral fellow at the Mayo Clinic.
Sean Mann	(B.S. student, Computer Science). <b>Research topic:</b> Automated construction of 3D shape models of brain regions. <b>Current status:</b> Graduate student in Computer Science, UCLA.
Gautam Prasad	(B.S. student, Computer Science). <b>Research topic:</b> Automated delineation of brain regions from structural MRI. <b>Research products:</b> Oral presentation at 2007 UC Davis Undergraduate Research Conference. <b>Current status:</b> PhD student in Computer Science, UCLA.

## Teaching And Mentoring Experience (continued)

- Ana Rapoport (B.S. student, Biology). **Research topic:** User interfaces for manual tracing of brain regions. **Research product:** Poster presentation at 2007 UC Davis Undergraduate Research Conference.
- Peter Harris (B.A. student, Exercise Biology). **Research topic:** Effects of chronic hypertension on morphology of the elderly brain. **Research products:** Journal paper, two UCD undergraduate journal papers, poster presentation at 2007 UC Davis Undergraduate Research Conference. **Current status:** Medical student at Dartmouth Medical College
- Joseph Hong (B.S. student, Biology). **Research topic:** Manual tracing of the cingulate cortex in elderly brains.

## Graduate Student Mentoring in Pittsburgh

During my postdoctoral fellowship, I met regularly with graduate students and their primary faculty advisors to help the students formulate and advance their independent research projects in medical image analysis.

- Leonid Teverovskiy (PhD student, Center for Automated Learning and Discovery, Carnegie Mellon University). **Research product:** Two conference papers published.
- Weiyang Dai (PhD student, Electrical Engineering, University of Pittsburgh). **Research products:** Three journal papers published. **Current status:** Postdoctoral fellow, Harvard Medical School
- Minjie Wu (PhD student, Electrical Engineering, University of Pittsburgh). **Research product:** One journal paper published

## Teaching at Carnegie Mellon University and University of Pittsburgh

- Advanced Perception Guest presentation on salient point detection in the Advanced Perception graduate seminar. **Instructor:** Dr. Martial Hebert
- Medical Image Analysis Guest lectures on image segmentation and shape modeling in University of Pittsburgh Medical Image Analysis course. **Instructor:** Dr. George Stetten
- Image Processing Guest lecture on shape-based object recognition in University of Pittsburgh undergraduate Introduction to Image Processing course. **Instructor:** Dr. Ching-Chung Li
- Teaching Assistant Graduate-level Mathematical Fundamentals For Robotics course at Caregie Mellon University. **Instructor:** Dr. Michael Erdmann

## Professional Activities

1997 - Present

### **Manuscript Reviews**

Journal of Neuroscience, IEEE International Symposium on Biomedical Imaging (ISBI 2014), Neuroscience, IEEE Transactions on Biomedical Engineering, Information Processing in Medical Imaging (IPMI) conference (2011, 2013), Neuroimage: Clinical, Human Molecular Genetics, Journal of the Neurological Sciences, Knowledge and Information Systems, Handbooks of Alzheimer's Disease, Human Brain Mapping, Neurology, International Conference on Software Engineering (ICSE 2010), Brain Research, Radiotherapy and Oncology, Archives of Neurology, Gender Medicine, International Journal of Geriatric Psychiatry, Magnetic Resonance Materials in Physics Biology and Medicine (MAGMA), Faculty of 1000 Medicine, Conference on Medical Image Computing and Computer-Aided Interventions (MICCAI 2008, 2012, 2013), MICCAI Workshop on Computational Anatomy and Physiology of the Hippocampus (CAPH 2008), Neuroimage, Neurocase, Neuroradiology, Journal of Magnetic Resonance Imaging, Journal of Computer Science and Technology, American Journal of Neuroradiology, Biological Psychiatry, IEEE Transactions on Medical Imaging (TMI), Neurobiology of Aging, Annals of Neurology, Psychiatry Research: Neuroimaging, Computer Vision and Image Understanding (CVIU), IEEE Transactions on Pattern Analysis And Machine Intelligence (PAMI), IEEE Transactions On Robotics And Automation (ITRA), Image and Vision Computing (IVC), IEEE Conference On Computer Vision And Pattern Recognition (CVPR), International Conference On Computer Vision (ICCV), IEEE Conference On Robotics And Automation (ICRA), IEEE/RSJ International Conference On Intelligent Robotic Systems (IROS), International Conference On Pattern Recognition (ICPR), International Joint Conference on Artificial Intelligence (IJCAI 2005), Cardiovascular Health Study Publications and Presentations Committee

2008-Present

### **Editorial Boards**

American Journal of Neurodegenerative Disease, Alzheimer's Disease and Associated Disorders, World Journal of Radiology, Biochimica et Biophysica Acta Clinical, Frontiers in Mathematics of Biomolecules

2005-Present

### **Conference Organizing and Abstract Reviews**

Abstract reviewer, 2013 Alzheimer's Association International Conference  
Oral session co-chair, 2012 IEEE Engineering in Medicine and Biology Conference  
Scientific Review Committee, 2011 and 2013 Information Processing in Medical Imaging (IPMI) Program Committee, 2010 American Association for Artificial Intelligence Annual Meeting  
Abstract reviewer, 2011 International Conference on Alzheimer's Disease  
Abstract reviewer, 2010 Organization for Human Brain Mapping Annual Meeting  
Abstract reviewer and oral session co-chair, 2008-2009 and 2011 American Academy of Neurology Annual Meeting  
Program Committee, 2005 ICCV Workshop on Computer Vision For Biomedical Image Applications (CVBIA)

## Professional Activities (continued)

2006-Present	<b>Grant Reviews</b> University of Arizona Alzheimer's Disease Center Pilot Grant Program (2007), University of Pittsburgh Older Americans Independence Center Pilot Program (2007 and 2008), UC Davis School of Medicine Bridge Funding Program, France-Berkeley Fund (2009), Alzheimer's Association Research Grant Program (2008-2012), National Institutes of Health Special Emphasis Panels ZRG1 MDCN-A (58) (July 2009), ZNS1 SRB-R 59 / 60 (June 2012), ZRG1 F02A-J (June 2013, Oct 2013), Department of Veterans Affairs Rehabilitation Research and Development Service Merit Review (August 2012), University of Southern California Alzheimer's Disease Research Center Pilot Grant Program (2012, 2013), Militarily Relevant Peer Reviewed Alzheimers Disease Research Program (MRPRA, 2013).
2007, 2012	<b>Member, University of Southern California Alzheimer's Disease Research Center External Advisory Committee</b>
2007-2008	<b>Member, UC Davis Biomedical Engineering Graduate Group Admissions Committee</b>
2008-present	<b>Member, UC Davis Neurology Department Faculty Development Committee</b>
2009	<b>Chair, UC Davis Neurology Department Academic Federation Peer Committee</b>
2010-2013	<b>Member, UC Davis Academic Senate Grade Change Committee</b>
2010-2011	<b>Member, UC Davis Applied Mathematics Graduate Group Admissions Committee</b>
2003 - Present	<b>Member, then Senior Member (2014), Institute for Electrical and Electronics Engineers</b>
2007 - Present	<b>Member, American Academy of Neurology</b>

## Awards

1997 - 2000	<b>National Science Foundation Graduate Student Fellowship</b>
2003-2004	<b>National Institutes of Health Institutional NRSA Postdoctoral Fellowship</b>
2006	<b>Appointed Fellow, Summer Research Institute in Geriatric Psychiatry</b>
2008	<b>Travel Fellowship, 6th Annual Mild Cognitive Impairment Symposium</b>
2010	<b>Travel Fellowship, International Conference on Alzheimer's Disease</b>
2011	<b>Finalist, UC Davis Academic Federation Award for Excellence in Research</b>

## Publications

### Peer-Reviewed Journal Papers

## Publications (continued)

- Evan Fletcher, **Owen Carmichael**, Ofer Pasternak, Klaus H Maier-Hein and Charles DeCarli. *Early brain loss in circuits affected by Alzheimers disease is predicted by fornix microstructure but may be independent of gray matter*. *Frontiers in Aging Neuroscience*, May 2014.
- Christina P Boyle; Cyrus A Raji, Kirk I Erickson, Oscar L Lopez, James T Becker, H. Michael Gach, W. T Longstreth, Jr., Leonid Teverovskiy; Lewis H Kuller, **Owen T Carmichael**, Paul Thompson. *Physical Activity, Body Mass Index, and Brain Atrophy in Alzheimer's Disease*. In press, *Neurobiology of Aging* (2014).
- **Owen Carmichael** and Lyudmila Sakhanenko. *Integral Curves From Noisy Diffusion MRI Data With Closed-Form Uncertainty Estimates*. In press, *Statistical Inference for Stochastic Processes* (2014).
- Disbrow, E. A., **O. Carmichael**, J. He, K. E. Lanni, E. M. Dressler, L. Zhang, N. Malhado-Chang, and K. A. Sigvardt. *Resting State Functional Connectivity is Associated with Cognitive Dysfunction in Non-Demented People with Parkinson's Disease*. *Journal of Parkinson's disease* (2014).
- Pauline Maillard, Evan Fletcher, Samuel Lockhart, Alexandra Roach, Bruce Reed, Dan Mungas, Charles DeCarli, **Owen Carmichael**. *White Matter Hyperintensities and their Penumbra Lie Along a Continuum of Injury In The Aging Brain*. In press, *Stroke*.
- Samuel Neal Lockhart, Alexandra E Roach, Steven J Luck, Joy Geng, Laurel Beckett, **Owen Carmichael**, Charles DeCarli. *White matter hyper intensities are associated with visual search behavior independent of generalized slowing in aging*. 52 (2014): 93-101.
- **Owen Carmichael**, Jun Chen, Debashis Paul and Jie Peng. *Diffusion tensor smoothing through weighted Karcher means*. *Electronic Journal of Statistics*, v. 7, 1913-1956, 2013.
- Evan Fletcher, Mekala Raman, Philip Huebner, Amy Liu, Dan Mungas, **Owen Carmichael**, Charles DeCarli. *Fornix white matter loss predicts cognitive impairment in cognitively normal elders*. In press, *JAMA Neurology* 2013.
- Josephine Barnes, **Owen T. Carmichael**, Kelvin K. Leung, Christopher Schwarz, Gerard R. Ridgway, Jonathan W. Bartlett, Ian B. Malone, Jonathan M. Schott, Martin N. Rossor, Geert Jan Biessels, Charlie DeCarli, Nick C. Fox, for the Alzheimer's Disease Neuroimaging Initiative. *Vascular and Alzheimer's disease markers independently predict brain atrophy rate in Alzheimer's Disease Neuroimaging Initiative controls*. *Neurobiology of Aging*, Volume 34, Issue 8, August 2013, Pages 1996-2002.
- Jing Xie, Evan Fletcher, Baljeet Singh, **Owen Carmichael**. *Robust Measurement of Individual Localized Changes to The Aging Hippocampus*. *Computer Vision and Image Understanding*, Volume 117, Issue 9, September 2013, Pages 1128-1137.
- Sarah Tomaszewski Farias, Lovingly Quitania Park, Danielle J. Harvey, Christa Simon, Bruce R. Reed, **Owen Carmichael**, Dan Mungas. *Everyday Cognition in older adults: Associations with neuropsychological performance and structural brain imaging*. *Journal of the International Neuropsychological Society*, 2013 Feb 1:1-12.

## Publications (continued)

- Thaddeus Haight, Susan Landau, **Owen Carmichael**, Christopher Schwarz, Charles DeCarli, William Jagust, for the Alzheimers Disease Neuroimaging Initiative. *Dissociable effects of Alzheimer's Disease and white matter hyperintensities on brain metabolism*. JAMA neurology (2013): 1-8.
- Guzman, V.A., **Carmichael, O.T.**, Schwarz, C., Tosto, G., Zimmerman, M.E., Brickman, A.M. for the Alzheimer's Disease Neuroimaging Initiative. *White matter hyperintensities and amyloid are independently associated with entorhinal cortex volume among individuals with mild cognitive impairment*. Alzheimers and Dementia 2013 Jan 30.
- **Owen Carmichael**, Donald G McLaren, Douglas Tommet, Dan Mungas, Richard N Jones. *Coevolution of brain structures in amnesic mild cognitive impairment*. Neuroimage, Volume 66, 1 February 2013, Pages 449456.
- Pauline Maillard, Sudha Seshadri, Alexa Beiser, Jayandra Himali, Rhoda Au, Evan Fletcher, **Owen Carmichael**, Philip A Wolf, Charles DeCarli. *Effects of systolic blood pressure on white-matter integrity in young adults in the Framingham Heart Study: a cross-sectional study*. The Lancet Neurology, Volume 11, Issue 12, December 2012, Pages 10391047. PMID: PMC3510663.
- Valerie A. Cardenas, Bruce Reed, Linda L. Chao, Helena Chui, Nerses Sanossian, Charles C. DeCarli, Wendy Mack, Joel Kramer, Howard N. Hodis, Mingzhu Yan, Michael H. Buonocore, **Owen Carmichael**, William J. Jagust, and Michael W. Weiner. *Associations Among Vascular Risk Factors, Carotid Atherosclerosis, and Cortical Volume and Thickness in Older Adults*. Stroke. 2012 Nov; 43(11): 2865-70.
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## Full-Length Peer-Reviewed Conference Papers

- **Note:** The Computer Science conference publications listed below are full-length (4-12 page) papers reviewed through competitive, double-blind processes and published in book format. Conference papers in this area are highly-competitive, highly-respected, and carry similar intellectual weight to journal papers.
- Ian Davidson, Sean Gilpin, **Owen Carmichael**, Peter Walker. *Network Discovery via Constrained Tensor Analysis of fMRI Data*. KDD 2013: The 19th ACM SIGKDD International Conference on Knowledge Discovery and Data Mining.
- Alex Tsui, Devin Fenton, Phong Vuong, Joel Hass, Patrice Koehl, Nina Amenta, David Coeurjolly, Charles DeCarli, **Owen Carmichael**. *Globally optimal cortical surface matching with exact landmark correspondence*. Proceedings of Information Processing in Medical Imaging (IPMI) 2013.
- Phong Vuong, David Drucker, Chris Schwarz, Evan Fletcher, Charles DeCarli, and **Owen Carmichael**, for the Alzheimers Disease Neuroimaging Initiative. *Effects of T2-Weighted MRI Based Cranial Volume Measurements on Studies of the Aging Brain*. Proceedings of SPIE: Medical Imaging 2013.
- Evan Fletcher, Baljeet Singh, Danielle Harvey, **Owen T. Carmichael**, Charles DeCarli. *Adaptive Image Segmentation for Robust Measurement of Longitudinal Brain Tissue Change*. Proceedings of the International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2012).
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- Evan Fletcher, **Owen T. Carmichael**, Charles DeCarli. *MRI Non-Uniformity Correction Through Interleaved Bias Estimation and B-Spline Deformation with a Template*. Proceedings of the International Conference of the IEEE Engineering in Medicine and Biology Society (EMBC 2012).
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### Book chapter

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- Jing He, Baljeet Singh, Bruce Reed, Dan Mungas, Charles DeCarli, **Owen Carmichael** *Hippocampal volume and functional connectivity in cognitive health, amnesic mild cognitive impairment, and Alzheimers disease*. Alzheimers Imaging Consortium and Alzheimer's Association International Conference 2012.
- S. N. Lockhart, A. E. Roach, J. He, E. Fletcher, P. Maillard, C. G. Schwarz, C. DeCarli, **O. Carmichael** *Heterogeneity of functional connectivity reductions in normal cognitive aging*. Alzheimers Imaging Consortium and Alzheimer's Association International Conference 2012.
- Yi Deng, Naomi J. Goodrich-Hunsaker, Margarita Cabaral, David G. Amaral, Kristopher Kalish, **Owen Carmichael**, Robert F. Dougherty, Michael Perry, Brian A. Wandell, Tony J. Simon. *Altered Hippocampal Connectivity and Midline Brain Anomalies in Children with Chromosome 22q11.2 Deletion Syndrome*. 18th Biennial International 22q11.2 Conference, 2012.
- Mario Riverol, James Becker, Oscar Lopez, Cyrus Raji, Paul Thompson, **Owen Carmichael**, H. Gach, W. T. Longstreth, Linda Fried, Russell Tracy, Lewis Kuller. *Cystatin C Predicts Changes in Brain Structure and Cognition in the Elderly*. 2012 American Academy of Neurology Annual Meeting.
- Mario Riverol, James Becker, Oscar Lopez, Cyrus Raji, Paul Thompson, **Owen Carmichael**, H. Gach, W. T. Longstreth, Linda Fried, Russell Tracy, Lewis Kuller. *Systemic Inflammatory Markers, Cognition and Brain Structure among Cognitively Normal Elderly*. 2012 American Academy of Neurology Annual Meeting.
- O L. Lopez, J. T. Becker, Y.F Chang, R.A Sweet, S.T. Dekosky, H M. Gach, **Owen Carmichael**, E. McDade, L.H. Kuller. *Incidence of mild cognitive impairment in the CHS Cognition Study*. 2012 American Academy of Neurology Annual Meeting.

## Publications (continued)

- Pauline Maillard, Sudha Seshadri, Alexa S. Beiser, Philip A. Wolf, Jayandra J. Himali, Sarah Preis, Rhoda Au, **Owen Carmichael**, Evan Fletcher, Charles DeCarli. *Effects of Vascular Risk Factors on White Matter Integrity in Middle-Aged Adults: A Voxel-Based Diffusion Tensor Imaging Study*. 2012 American Academy of Neurology Annual Meeting.
- **Owen Carmichael**, Jing Xie, Baljeet Singh, Evan Fletcher, Charles DeCarli. *Baseline CSF amyloid and tau are associated with localized hippocampus change independent of total hippocampus volume*. 2012 American Academy of Neurology Annual Meeting.
- James T. Becker, Leonid Teverovisky, H. Gach, **Owen T. Carmichael**, Paul M. Thompson, Lewis Kuller and Oscar L. Lopez. *Differential Rates of Brain Volume Loss as a Function of Time To Develop AD among Cognitively Normal Individuals*. 2012 American Academy of Neurology Annual Meeting.
- Vanessa A. Guzman, C. G. Schwarz, **O. Carmichael**, Adam M. Brickman. *Entorhinal cortex volume, white matter hyperintensities, and memory in Mild Cognitive Impairment*. International Neuropsychological Society Annual Meeting 2012.
- S.N. Lockhart, A.B.V. Mayda, A.E. Roach, P. Maillard, C. G. Schwarz, **O. Carmichael**, E. Fletcher, C. DeCarli. *White matter injury is associated with episodic memory function independent of age and microstructural changes*. International Society of Vascular Behavioural and Cognitive Disorders (VasCog) 2011.
- Pauline Maillard, **Owen Carmichael**, Danielle Harvey, Evan Fletcher, Bruce Reed, Dan Mungas, Charles DeCarli. *FLAIR and DTI as predictors of White Matter Hyperintensities*. International Society of Vascular Behavioural and Cognitive Disorders (VasCog) 2011.
- Jing He, **Owen Carmichael**, Baljeet Singh, Evan Fletcher, Oliver Martinez, Bruce Reed, Dan Mungas, Charles DeCarli. *Functional connectivity, grey matter, and WMH volume independently predict memory performance in cognitively normal elders*. International Society of Vascular Behavioural and Cognitive Disorders (VasCog) 2011.
- Jing He, Charles DeCarli, Dan Mungas, Bruce Reed, Jing He, Evan Fletcher, Baljeet Singh, Ana-Maria Iosif, Oliver Martinez, **Owen Carmichael**. *Correlations between functional connectivity, structural brain volume, and episodic memory in cognitively normal older adults*. 2011 International Conference on Alzheimer's Disease.
- Natalie L Marchant, Cindee Madison, William Jagust, **Owen Carmichael**, Charles DeCarli, Bruce Reed, Oliver Martinez. *Effects of MRI markers of cerebrovascular disease on amyloid burden and cognition in aging*. 2011 International Conference on Alzheimer's Disease.
- Josephine Barnes, **Owen Carmichael**, Kelvin Leung, Christopher Schwarz, Gerard R Ridgway, Jonathan Bartlett, Ian Malone, Jonathan M Schott, Martin N Rossor, Geert Jan Biessels, Charlie DeCarli, Nick C Fox. *The independent effects of white matter hyperintensity volume and cerebrospinal fluid amyloid levels on brain atrophy*. Oral presentation, 2011 International Conference on Alzheimer's Disease Alzheimer's Imaging Consortium.



## Publications (continued)

- Jennifer Lee, Danielle Harvey, **Owen Carmichael**, Dan Mungas, Bruce Reed, John Olichney, Berneet Kaur, Joshua Miller, Charles DeCarli. *Androgen-Estrogen Balance, SHBG, and Cognitive Trajectories in Older Men and Women*. 2011 American Academy of Neurology Annual Meeting.
- Pauline Maillard, Evan Fletcher, Danielle Harvey, **Owen Carmichael**, Bruce Reed, Dan Mungas, Charles DeCarli. *White Matter Hyperintensity Penumbra*. 2011 American Academy of Neurology Annual Meeting.
- Aria Jafari, Christopher Schwarz, **Owen Carmichael**, Evan Fletcher, Michael Greicius. *Interactive Effects of Structural and Functional Brain Changes in Age-Related Cognitive Decline*. 2011 American Academy of Neurology Annual Meeting.
- Lovingly Park, Sarah Farias, **Owen Carmichael**, Dan Mungas, Charles DeCarli. *Structural Changes in the Prefrontal Cortex and White Matter Disease Differentially Relate to Cognitive Functioning*. 2011 American Academy of Neurology Annual Meeting.
- **Owen Carmichael**, Jing Xie, Evan Fletcher, Baljeet Singh, Charles DeCarli. *Localized Hippocampus Markers Change Earlier in the Alzheimer Pathological Process Than Total Hippocampus Volume Does*. 2011 American Academy of Neurology Annual Meeting.
- Jing He, **Owen Carmichael**, Evan Fletcher, Baljeet Singh, Bruce Reed, Dan Mungas, Charles DeCarli. *Functional Connectivity, Structural Brain and Cognitive Performance in Elderly*. 2011 American Academy of Neurology Annual Meeting.
- **Owen Carmichael**, Dan Mungas, Laurel Beckett, Danielle Harvey, Sarah Tomaszewski Farias, Bruce Reed, Jing He, John Olichney, Joshua Miller, Charles DeCarli. *Predictors of clinical conversion to dementia in a diverse cohort*. 2010 International Conference on Alzheimer's Disease (ICAD).
- James T. Becker, Bruce Cohen, Eileen Martin, Eric M. Miller, Joanne Mullen, Ann Ragin, Ned Sacktor, Ola Selnes, **Owen Carmichael**. *Predictors of Ventricular Volume in HIV Disease*. 2010 American Academy of Neurology Annual Meeting.
- **Owen Carmichael**, Dan Mungas, Laurel Beckett, Danielle Harvey, Sarah Tomaszewski Farias, Bruce Reed, John Olichney, Joshua Miller, Charles DeCarli. *MRI predictors of cognitive change in a diverse and carefully characterized elderly population*. 2010 American Academy of Neurology Annual Meeting.
- Charles DeCarli, David Drucker, Evan Lloyd, **Owen Carmichael**, Evan Fletcher, Dan Mungas, *Amyloid Beta Effects on Cognition Are Mediated by Cell Injury (Tau) and Death (Progressive Atrophy)*. 2009 American Academy of Neurology Annual Meeting.
- Evan Fletcher, Evan Lloyd, David Drucker, **Owen Carmichael**, Charles DeCarli. *ApoE Genotype Is Associated with Rate of Hippocampal Atrophy Independent of Clinical Diagnosis: Data from the ADNI Study*. 2009 American Academy of Neurology Annual Meeting.
- Dan Mungas, David Drucker, Evan Lloyd, **Owen Carmichael**, Evan Fletcher, Charles DeCarli. *Regional Rates of Brain Atrophy Are Significantly Associated with Rates of Cognitive Decline Even after Adjusting for Clinical Syndrome*. 2009 American Academy of Neurology Annual Meeting.

## Publications (continued)

- Jing He, Evan Fletcher, Oliver Martinez, **Owen Carmichael**, Charles DeCarli. *White Matter Hyperintensities, Incident MRI Infarcts Correlate with Cognition (ADNI Study)*. 2009 American Academy of Neurology Annual Meeting.
- Dan Mungas, Bruce Reed, Sarah Farias, **Owen Carmichael**, Kimberly Carter, Charles DeCarli. *Intracranial Volume and Brain Structure Effects on Cognition in Diverse Older Persons*. 2009 American Academy of Neurology Annual Meeting.
- C. Raji, O. Lopez, L. Kuller, **O. T. Carmichael**, J. Becker. *Independent Effects of Age and Alzheimer's Disease on Gray Matter Volume*. 2009 American Academy of Neurology Annual Meeting.
- Cyrus Raji, Oscar Lopez, James Becker, Weiyang Dai, **Owen Carmichael**, Lewis Kuller. *Hypertension-related Gray Matter Volume Loss in Normal Aging, Mild Cognitive Impairment, and Alzheimer Disease Brains*. 2008 Radiological Society of North America Annual Meeting.
- C. DeCarli, **O. T. Carmichael**, D. Mungas, B. Reed, O. Martinez, M. Perisianinova, M. Ortega, E. Fletcher. *Evidence for transynaptic degeneration of fornix fibers in Alzheimer's disease*. 2008 International Conference on Alzheimer's Disease (ICAD) and ICAD Alzheimer's Imaging Consortium.
- C. DeCarli, E. Fletcher, B. Reed, S. Farias, **O. T. Carmichael**, O. Martinez, M. Ortega, D. Mungas. *Regional fractional anisotropy (FA) and cognitive performance in normal cognition, MCI and dementia*. 2008 International Conference on Alzheimer's Disease (ICAD) Alzheimer's Imaging Consortium.
- **O. T. Carmichael**, David Drucker, E. Fletcher, M. Ortega, Jing He, Mitsuhiro Yoshita, C. DeCarli. *Baseline MRI measures of cerebrovascular disease in the Alzheimers disease neuroimaging initiative*. 2008 International Conference on Alzheimer's Disease (ICAD) and ICAD Alzheimer's Imaging Consortium.
- E. Fletcher, M. Persianinova, **O. T. Carmichael**, Alexa Beiser, Sudha Seshadri, Rhoda Au, Philip A. Wolf, C. DeCarli. *Hippocampal shape change correlates with delayed memory performance in middle aged adults of the Framingham heart study (FHS)*. 2008 International Conference on Alzheimer's Disease (ICAD) and ICAD Alzheimer's Imaging Consortium.
- Jing Xie, C. DeCarli, E. Fletcher, D. Mungas, B. Reed, O. Martinez, M. Persianinova, D. Alcantara, N. Amenta, **O. T. Carmichael**. *Spatially-localized hippocampal atrophy measures correlate with domain-specific cognitive decline, AD, and MCI sub-type*. 2008 International Conference on Alzheimer's Disease (ICAD) and ICAD Alzheimer's Imaging Consortium.
- **O. T. Carmichael**, David Drucker, Christopher Schwarz, E. Fletcher, O. Martinez, Mitsuhiro Yoshita, Jing He, C. DeCarli. *Longitudinal changes in cognition and cerebrovascular disease in the Alzheimers disease neuroimaging initiative*. 2008 International Conference on Alzheimer's Disease (ICAD) and ICAD Alzheimer's Imaging Consortium.
- E. Fletcher, B. Reed, S. Farias, **O. T. Carmichael**, O. Martinez, M. Ortega, D. Mungas, C. DeCarli. *Regional Fractional Anisotropy (FA) and Cognitive Performance in Individuals with normal and impaired cognition*. 2008 American Academy of Neurology Annual Meeting.

## Publications (continued)

- C. DeCarli, **O. T. Carmichael**, D. Mungas, B. Reed, O. Martinez, M. Persianinova, M. Ortega, E. Fletcher. *Hippocampal atrophy is accompanied by degeneration of fornix white matter tracts in Alzheimers disease*. 2008 American Academy of Neurology Annual Meeting.
- E. Fletcher, D. Mungas, B. Reed, M. Ortega, O. Martinez, **O. T. Carmichael**, C. DeCarli. *Vascular risk factors affect white matter integrity after accounting for the effect of white matter hyperintensities*. 2008 American Academy of Neurology Annual Meeting.
- P. Harris, D. Alcantara, N. Amenta, O. Lopez, G. Eirskdttir, S. Sigurdsson, V. Gudnason, P. Thompson, L. Launer, **O. T. Carmichael**. *Localized Measures of Callosal Atrophy Are Associated with Late-Life Hypertension in a Population-Based Study: AGES-Reykjavik Study*. 2008 American Academy of Neurology Annual Meeting.
- **O. T. Carmichael**, D. Drucker, E. Fletcher, M. Ortega, M. Yoshita, J. He, C. DeCarli. *MRI Measures of Cerebrovascular Disease in the Alzheimers Disease Neuroimaging Initiative*. 2008 American Academy of Neurology Annual Meeting.
- **O. T. Carmichael**, P. M. Thompson, R. Dutton, A. Lu, S. Lee, J. Lee, L. Kuller, O. Lopez, H. Aizenstein, C. Meltzer, Y. Liu, A. Toga, J. T. Becker *Spatial Mapping of Ventricular Changes Related to Dementia and Mild Cognitive Impairment in a Large Community-Based Cohort*. Podium presentation, American Academy of Neurology Annual Meeting, April 28-May 5, 2007.
- W. Dai, O. L. Lopez, **O. T. Carmichael**, J.T. Becker, L.H. Kuller, H. M. Gach. *Effects of Cardiovascular Disease Risk Factors on Regional Cerebral Blood Flow in Dementia*. Poster presentation, International Society for Magnetic Resonance in Medicine (ISMRM) Scientific Meeting, May 19-25, 2007, Berlin: 2151.
- S. Ziolkko, R. Narendran, C. Becker, **O. T. Carmichael**, W. Frankle, W. Kaye, J. Price. *A comparison of automated, fully deformable atlas based segmentation and manually drawn striatal volumes of interest as applied to PET scans*. Poster presentation, Organization for Human Brain Mapping Annual Meeting, 2007.
- M. Yoshita, E. Fletcher, **O.T. Carmichael**, M. Ortega, O. Martinez, D. Mungas, B. Reed, C. DeCarli. *Diffusion Tensor Imaging of Cognitive Normal Elderly in Cerebral White Matter: Relation to White Matter Hyperintensities*. Oral presentation, International Stroke Conference 2007.
- W. Dai, **O. T. Carmichael**, O. T. Lopez, J. T. Becker, L. H. Kuller, H. M. Gach. *Assessment of hypertension on cerebral blood flow and dementia using CASL MRI*. Poster presentation, International Society for Magnetic Resonance in Medicine (ISMRM) Scientific Meeting, 2006.
- W. Dai, **O. T. Carmichael**, O. T. Lopez, H. M. Gach. *Comparison of two spatial normalization methods in the elderly brain*. Poster presentation, International Society for Magnetic Resonance in Medicine (ISMRM) Scientific Meeting, 2006.
- **O. T. Carmichael**, L. H. Kuller, O. L. Lopez, P. M. Thompson, R. A. Dutton, A. Lu, S. E. Lee, J. Y. Lee, H. J. Aizenstein, C. C. Meltzer, Y. Liu, A. W. Toga, J. T. Becker. *Longitudinal study of cerebral ventricular atrophy rates in the Cardiovascular Health Study*. Poster presentation, American Academy of Neurology (AAN) Annual Meeting 2006.

## Publications (continued)

- L. Teverovskiy, Y. Liu, J. Spears, J. Becker, H. Aizenstein, **O. T. Carmichael**, C. Meltzer. *Brain asymmetry as a predictor of age*, Poster presentation, Organization for Human Brain Mapping Annual Meeting, 2005
- J. Spears, P. Greer, S. Ziolk, H. Aizenstein, **O. T. Carmichael**, J. Becker, C. Meltzer. *Construction and Evaluation of an age-specific neurological template*, Poster presentation, Organization for Human Brain Mapping Annual Meeting, 2005
- **O. T. Carmichael**, P. Thompson, R. Dutton, A. Lu, S. Lee, J. Lee, K. Hayashi, A. Toga, O. Lopez, H. Aizenstein, Y. Liu, C. Meltzer, J. Becker. *Dementia-Associated Ventricular Volume Changes In A Community Cohort*, Poster presentation, Organization for Human Brain Mapping Annual Meeting, 2005
- **O. T. Carmichael**, P. Thompson, R. Dutton, A. Lu, S. Lee, J. Lee, K. Hayashi, A. Toga, O. Lopez, H. Aizenstein, Y. Liu, C. Meltzer, J. Becker. *Mapping 3-Dimensional Ventricular Changes in HIV/AIDS With Manual and Fully-Automated Tracings*, Poster presentation, Organization for Human Brain Mapping Annual Meeting, 2005
- **O. T. Carmichael**, H. J. Aizenstein, S. W. Davis, J. T. Becker, P. M. Thompson, C. C. Meltzer, Y. Liu. *Atlas-Based Hippocampus Segmentation In Alzheimer's Disease and Mild Cognitive Impairment*. Oral presentation, International Society for Magnetic Resonance in Medicine (ISMRM) Scientific Meeting, 2005
- W. Dai, O. L. Lopez, **O. T. Carmichael**, V. Lakkavaram, S. Z. Grahovac, J. T. Becker, L. H. Kuller, H. M. Gach. *Differences of regional cerebral blood flow in mild cognitive impairment and early Alzheimers disease measured with CASL*. Oral presentation, International Society for Magnetic Resonance in Medicine (ISMRM) Scientific Meeting, 2005
- M. Wu, **O. T. Carmichael**, H. J. Aizenstein. *Quantitative Comparison of Neuroimage Registration for fMRI Analyses by AIR, SPM, and a Fully Deformable Model*. Poster presentation, International Society for Magnetic Resonance in Medicine (ISMRM) Scientific Meeting, 2005
- W. Dai, O.L. Lopez, **O. T. Carmichael**, V. Lakkavaram, J. T. Becker, H. M. Gach. *Changes of regional cerebral blood flow in mild cognitive impairment and early Alzheimer's Disease measured with continuous arterial spin labeled MRI*. Oral presentation, American Academy of Neurology Annual Meeting, November 2004
- Y. Liu, L. Teverovskiy, **O. T. Carmichael**, H. Aizenstein, J. T. Becker, O. L. Lopez, V. A. Stenger, C. Meltzer. *AD and MCI Classification from Cross-sectional MRI using Discriminative Subspace Analysis*. Poster presentation, American Academy of Neurology Annual Meeting, November 2004

## Non-Peer-Reviewed Papers

- Henry Phillips, Peter Walker, Carrie Kennedy, **Owen Carmichael**, Ian Davidson. *Guided Learning Algorithms: An Application of Constrained Spectral Partitioning to Functional Magnetic Resonance Imaging*. Proceedings of HCI International 2013.

## Publications (continued)

- **O. Carmichael**, S. Salloway. *Imaging markers of incipient dementia: The white matter matters* Editorial, In Press, Neurology 2012.
- **O. Carmichael**, O.L. Lopez, J. T. Becker, L. Kuller. *Trajectories of brain loss in aging and the development of cognitive impairment* (Comment on Neurology 70(11):828-33, Mar 11 2008), Neurology 72(8):771, Feb 24 2009.
- V. Broz, **O. Carmichael**, S. Thayer, J. Osborn, and M. Hebert. *ARTISAN: An Integrated Scene Mapping and Object Recognition System*. American Nuclear Society 8th Intl. Topical Meeting on Robotics and Remote Systems, American Nuclear Society, April, 1999
- A. Johnson, **O. Carmichael**, D. Huber, M. Hebert. *Toward A General 3-D Matching Engine: Multiple Models, Complex Scenes, and Efficient Data Filtering*. Proceedings 1998 Image Understanding Workshop (IUW)
- A.R. Neureuther and **O. Carmichael**, *Computer Intensive Problems in Simulation of Integrated Circuit Lithography and Topography*, Proceedings of NASA AMES Workshop, March 1996

## Technical Reports

- **O. Carmichael**, H. J. Aizenstein, S. W. Davis, J. T. Becker, P. M. Thompson, C. C. Meltzer, Y. Liu. *Atlas-Based Hippocampus Segmentation In Alzheimer's Disease and Mild Cognitive Impairment*. Carnegie Mellon University Robotics Institute Technical Report CMU-RI-TR-04-53, December 2004
- **O. Carmichael**, S. Mahamud, M. Hebert, *Discriminant Filters For Object Recognition*, Robotics Institute Technical Report TR-02-09, Carnegie Mellon University, March 4, 2002

## Presentations

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|-------------------|---|
| October 2, 2013   | · <i>The Brain as an End Organ of Cardiovascular and Metabolic Disorders</i> . Invited Seminar, Pennington Biomedical Research Center.                |
| September 4, 2013 | · <i>Update on PET imaging in Alzheimer's Disease</i> . Frontiers in Biomedical Imaging Seminar Series, Radiology Department, UC Davis.               |
| May 29, 2013      | · <i>Alzheimers disease: Overview of current research, caregiver issues, and advocacy</i> . Greater Sacramento Health Ministry Network Meeting.       |
| May 27, 2013      | · <i>Estimating Brain Networks From Neuroimaging Data: The Wild West Era</i> . Invited Seminar, NYU Poly Computer Science and Engineering Department. |
| April 12, 2013    | · <i>Estimating Brain Networks From Neuroimaging Data: The Wild West Era</i> . UC Davis Statistical Sciences Symposium 2013.                          |

## Presentations (continued)

- January 24, 2013 · *Imaging Aging Brain Networks: The View From The Wild West*. UC Davis Neurology Department Grand Rounds. (Average evaluation score: 4.75 / 5.)
- January 16, 2013 · *Why are there no effective drugs for Alzheimer's Disease?*. California Retired Teachers Association General Meeting (Division 67), Roseville, CA.
- December 13, 2012 · *New Faculty Workshop: Understanding Differences Among The Faculty Series*. Group discussion leader, UC Davis Health System.
- November 29, 2012 · *Working Dads Need Career Flexibility Too: How to Integrate Work, Life and Family*. Panel discussion, UC Davis Health System.
- November 2, 2012 · *Imaging Aging Brain Networks: Findings and Challenges*. UCSF Memory and Aging Center Grand Rounds.
- October 22, 2012 · *Should You Publish in Open Access Journals?* Panel discussion organized by UC Davis Health Sciences Libraries.
- June 18, 2012 · *The Pathological Course of Alzheimers Disease: Why Finding a Cure Has Been So Hard*. California Retired Teachers Association Division 25 Annual Symposium, Carmichael, CA.
- May 30, 2012 · *The Pathological Course of Alzheimers Disease: Why Finding a Cure Has Been So Hard*. Keynote address at Alzheimers Disease: Continuum of Care VI, Petaluma, CA
- January 26, 2012 · *Statistical challenges in diffusion MRI and resting state functional MRI*. Statistics Colloquium, Department of Statistics and Graduate Group in Biostatistics, UC Davis.
- November 30, 2011 · *The Pathological Course of Alzheimers Disease: Why Finding a Cure Has Been So Hard*. Keynote address at Understanding Memory Loss: Strategies for Success III, Yountville, CA
- October 11, 2011 · *Diffusion MRI and resting state functional MRI: two brain imaging modalities that need statistical help*. Statistics Department colloquium, Michigan State University.
- June 14, 2011 · *Alzheimer's Disease Neuroimaging: Overview And Recent Developments*. Frontiers in Biomedical Imaging Seminar Series, Radiology Department, UC Davis.
- May 25, 2011 · *Why are there no effective drugs for Alzheimer's Disease?*. California Retired Teachers Association General Meeting (Yolo County, Division 83), Woodland, CA.
- March 15, 2011 · *Why are there no effective drugs for Alzheimer's Disease?*. California Retired Teachers Association Annual Symposium (Sacramento Area 3, Division 5), Sacramento CA.
- February 11, 2011 · *Functional connectivity of the aging human brain from resting BOLD fMRI*. Computational Neuroscience Colloquium, UC Davis.

## Presentations (continued)

- October 28, 2010 · *Novel imaging biomarkers for Alzheimer's disease and cerebrovascular disease.* Neurology Department Grand Rounds, UC Davis (Average evaluation score: 4.75 / 5.)
- July 15, 2010 · *MRI markers for AD in an ethnically-diverse population.* Invited talk, International Conference on Alzheimer's Disease.
- March 13, 2010 · *Dynamics of brain changes and cognitive changes in aging and late-life neurodegenerative disease.* Invited talk, UC Davis One-Day Workshop on Modeling Dynamical Systems.
- March 17, 2009 · *Dementia: overview and current research.* California Retired Teachers Association Annual Symposium (Sacramento Area 3, Division 5), Sacramento CA.
- January 10, 2009 · *Current mathematical challenges in imaging of the aging brain.* Graduate Group in Applied Mathematics Mini-Conference, UC Davis.
- October 16, 2008 · *Novel neuroimaging-based measures of brain structure in healthy aging and dementia.* Neurology Department Scientific Research Conference, UC Davis.
- October 15, 2007 · *Current Mathematical Challenges in Neuroimaging.* Graduate Group in Applied Mathematics Seminar, UC Davis.
- September 22, 2007 · *Computational Methods For Brain Structure Quantification From In Vivo Human MRI.* Center For Neuroscience Retreat, UC Davis.
- July 2, 2007 · *Advanced MR Morphometric Measures and Late-Life Cognitive Decline.* Neuroradiology Seminar, Leiden University Medical Center.
- February 12, 2007 · *Automated Image Processing For Brain Change Analysis in Late-Life Cognitive Decline.* Biomedical Engineering Department Seminar, UC Davis
- June 30, 2006 · *Large-scale studies of cerebral ventricle dilation in mild cognitive impairment and dementia.* Alzheimer's Association Northern California Research Symposium .
- October 10, 2006 · *Gross-Scale Morphological Changes Associated With Mild Cognitive Impairment, Dementia, and Cardiovascular Conditions From In-Vivo Structural MRI.* Neurological Surgery Grand Rounds, UC Davis Medical Center
- October 20, 2005 · *Image Processing Methods For Large-Scale Studies of Neurodegenerative Disease.* Neurology Grand Rounds, UC Davis Medical Center. (Average evaluation score: 4.71 / 5.
- October 13, 2005 · *Image Processing Methods For Large-Scale Studies of Neurodegenerative Disease.* Computer Science Department Colloquium, UC Davis
- July 20, 2004 · *Computational Methods for Prediction of Late-Life Cognitive Decline..* Computer and Information Sciences Department Seminar, University of Pennsylvania

## Presentations (continued)

- July 20, 2004 · *Computational Methods for Prediction of Late-Life Cognitive Decline..* Section of Biomedical Image Analysis Seminar, University of Pennsylvania
- September 16, 2002 · *Detecting Wiry, Holey Objects In Cluttered Scenes.* VASC Seminar, Carnegie Mellon University