

Jason Joseph Corso

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APPOINTMENT	Assistant Professor Computer Science and Engineering SUNY at Buffalo <i>Full list of appointments begins on page 12</i>	BUFFALO, NY 8/2007 - PRESENT
RESEARCH FOCUS	Bridging from data to understanding, primarily in visual problems, by investigating (1) the role of ontology in learning and inference, (2) semi- and fully-automatic learning of mid-level, hierarchical, probabilistic, and statistical models from massive data, (3) robust efficient inference algorithms for holistic image understanding and (4) the role of the user in learning and inference.	
RESEARCH AREAS	<ul style="list-style-type: none">• Computer Vision and Medical Imaging• Statistical Machine Learning• Ontology and Probabilistic Ontology• Machine Intelligence• Computational Finance• Perceptual User Interface	
EDUCATION	The Johns Hopkins University Ph.D. in Computer Science ADVISOR: Dr. Gregory D. Hager DISSERTATION TITLE: <i>"Techniques for Vision-Based Human-Computer Interaction"</i>	BALTIMORE, MD 6/2006
	The Johns Hopkins University M.S.E. in Computer Science PROJECT 1 ADVISOR: Dr. Gregory D. Hager, Computational Interaction and Robotics Lab (CIRL) PROJECT 1 TITLE: <i>"Planar Surface Tracking Using Direct Stereo"</i> PROJECT 2 ADVISOR: Dr. Jonathan Cohen, Graphics Lab PROJECT 2 TITLE: <i>"Out-Of-Core Voxelization of Large Scalar Fields for Interactive Multiresolution Volume Rendering"</i>	BALTIMORE, MD 6/2002
	Loyola College in Maryland B.S. in Computer Science, <i>Cum Laude</i> , Ranked First in Major ADVISOR: Dr. Roger Eastman	BALTIMORE, MD 5/2000
	Chaminade High School MINEOLA, NY	
DISTINCTIONS	SUNY at Buffalo Young Investigator Award Army Research Office Young Investigator Award <i>Guidance By Semantics-High-Level Visual Inference to Improve Vision-based Mobile Robot Localization</i> National Science Foundation CAREER Award <i>Generalized Image Understanding with Probabilistic Ontologies and Dynamic Adaptive Graph Hierarchies</i> DARPA Computer Science Study Group <i>A distinction awarded to junior faculty for revolutionary activities in defense-relevant research</i> SUNY at Buffalo STOR Visionary Innovator <i>Awarded for licensing technology to industry.</i> Best New Development <i>UCLA Laboratory of Neuroimaging, CCB AHM Segmentation Contest</i>	2011 2010 2009 2009 2009 2006

Link Foundation Fellowship in Advanced Simulation and Training	2003
James D Rozics Computer Science Medal - Loyola College in Maryland <i>Awarded to the computer science student ranked first upon graduation</i>	2000
Upsilon Pi Epsilon Scholarship , Computer Science Honors Society	1998
Hauber Summer Science Research Fellowship - Loyola College in Maryland	1998

PATENTS

- P1. **J. J. Corso**, M. Smith, and M. Filipovich. System and Method for Mosaicing Endoscope Images Captured From Within A Cavity. Patent Pending (12/347,855).

PUBLICATIONS

JOURNAL ARTICLES

- J11. **J. J. Corso**. Toward parts-based scene understanding with pixel-support parts-sparse pictorial structures. *Pattern Recognition Letters: Special Issue on Scene Understanding and Behavior Analysis*, 2013. To appear. Early version appears as arXiv.org tech report 1108.4079v1. **(PRL)**
- J10. R. S. Alomari, **J. J. Corso**, V. Chaudhary, and G. Dhillon. Toward a clinical lumbar CAD: Herniation diagnosis. *International Journal of Computer Aided Radiology and Surgery*, 6(1):119–126, 2011. **(IJCARS)**
- J9. R. S. Alomari, **J. J. Corso**, and V. Chaudhary. Labeling of lumbar discs using both pixel- and object-level features with a two-level probabilistic model. *IEEE Transactions on Medical Imaging*, 30(1):1–10, 2011. **(IEEE TMI)**
- J8. P. B. Noël, A. Walczak, J. Xu, **J. J. Corso**, K. R. Hoffmann, and S. Schafer. GPU-based cone beam computed tomography. *Computer Methods and Programs in Biomedicine*, 98(3):271–277, 2010. **(CMPB)**
- J7. R. S. Alomari, **J. J. Corso**, V. Chaudhary, and G. Dhillon. Computer-aided diagnosis of lumbar disc pathology from clinical lower spine MRI. *International Journal of Computer Aided Radiology and Surgery*, 5(3):287–293, 2010. **(IJCARS)**
- J6. **J. J. Corso** and G. D. Hager. Image Description with Features that Summarize. *Computer Vision and Image Understanding*, 113:446–458, 2009. **(CVIU)**
- J5. **J. J. Corso**, G. Ye, D. Burschka, and G. D. Hager. A Practical Paradigm and Platform for Video-Based Human-Computer Interaction. *IEEE Computer*, 42(5):48–55, 2008. **(IEEE Computer)**
- J4. **J. J. Corso**, E. Sharon, S. Dube, S. El-Saden, U. Sinha, and A. Yuille. Efficient Multilevel Brain Tumor Segmentation with Integrated Bayesian Model Classification. *IEEE Transactions on Medical Imaging*, 27(5):629–640, 2008. **(IEEE TMI)**
- J3. **J. J. Corso**, G. Ye, and G. D. Hager. Analysis of Composite Gestures with a Coherent Probabilistic Graphical Model. *Virtual Reality*, 8(4):242–252, 2005. **(VR)**
- J2. D. Burschka, **J. J. Corso**, M. Dewan, W. Lau, M. Li, H. Lin, P. Marayong, N. Ramey, G. D. Hager, B. Hoffman, D. Larkin, and C. Hasser. Navigating Inner Space: 3-D Assistance for Minimally Invasive Surgery. *Robotics and Autonomous System*, 2005. **(RAS)**
- J1. G. Ye, **J. J. Corso**, D. Burschka, and G. D. Hager. VICs: A Modular HCI Framework Using Spatio-Temporal Dynamics. *Machine Vision and Applications*, 16(1):13–20, 2004. **(MVA)**

CONFERENCE PROCEEDINGS (PEER-REVIEWED)

- C56. C. Xiong, D. Johnson, R. Xu, and **J. J. Corso**. Random forests for metric learning with implicit pairwise position dependence. In *Proceedings of ACM SIGKDD International Conference on Knowledge Discovery and Data Mining*, 2012. **(KDD 2012)**
- C55. S. Sadanand and **J. J. Corso**. Action bank: A high-level representation of activity in video. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, 2012. **(CVPR 2012)**
- C54. C. Xu and **J. J. Corso**. Evaluation of super-voxel methods for early video processing. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, 2012. **(CVPR 2012)**
- C53. P. Agarwal, S. Kumar, J. Ryde, **J. J. Corso**, and V. N. Krovi. Estimating human dynamics on-the-fly using monocular video for pose estimation. In *Proceedings of Robotics Science and Systems*, 2012. **(RSS 2012)**
- C52. R. Xu, P. Agarwal, S. Kumar, V. N. Krovi, and **J. J. Corso**. Combining skeletal pose with local motion for human activity recognition. In *Proceedings of VII Conference on Articulated Motion and Deformable Objects*, 2012. **(AMDO 2012)**

- C51. G. Chen, C. Xiong, and **J. J. Corso**. Dictionary transfer for image denoising via domain adaptation. In *Proceedings of IEEE International Conference on Image Processing*, 2012. **(ICIP 2012)**
- C50. K. R. Keane and **J. J. Corso**. Dynamically mixing dynamic linear models with applications in finance. In *Proceedings of International Conference on Pattern Recognition Applications and Methods*, 2012. **(ICPRAM 2012)**
- C49. J. A. Delmerico, P. David, and **J. J. Corso**. Building facade detection, segmentation, and parameter estimation for mobile robot localization and guidance. In *Proceedings of International Conference on Intelligent Robots and Systems*, 2011. **(IROS 2011)**
- C48. P. Agarwal, S. Kumar, **J. J. Corso**, and V. N. Krovi. Estimating dynamics on-the-fly using monocular video. In *Proceedings of 4th Annual Dynamic Systems and Control Conference*, 2011. **(DSCC 2011)**
- C47. D. Gagneja, C. Xiong, and **J. J. Corso**. Towards a parts-based approach to sub-cortical brain structure parsing. In *Proceedings of SPIE Conference on Medical Imaging*, 2011. **(SPIE 2011)**
- C46. A. Y. C. Chen and **J. J. Corso**. Temporally consistent multi-class video-object segmentation with the video graph-shifts algorithm. In *Proceedings of the 2011 IEEE Workshop on Motion and Video Computing*, 2011. **(IEEE WMVC 2011)**
- C45. D. R. Schlegel, A. Y. C. Chen, C. Xiong, J. A. Delmerico, and **J. J. Corso**. AirTouch: Interacting with computer systems at a distance. In *Proceedings of IEEE Winter Vision Meetings: Workshop on Applications of Computer Vision (WACV)*, 2011. **(IEEE WACV 2011)**
- C44. W. Ceusters, **J. J. Corso**, Y. Fu, M. Petropoulos, and V. Krovi. Introducing ontological realism for semi-supervised detection and annotation of operationally significant activity in surveillance videos. In *Proceedings of the 5th International Conference on Semantic Technologies for Intelligence, Defense and Security (STIDS)*, 2010. **(STIDS 2010)**
- C43. R. S. Alomari, **J. J. Corso**, V. Chaudhary, and G. Dhillon. Lumbar disc herniation cad with a GVF-snake model. In *Proceedings of the 24th International Conference on Computer Aided Diagnosis and Surgery (CARS '10)*, 2010. **(CARS 2010)**
- C42. M. R. Malgireddy, **J. J. Corso**, S. Setlur, V. Govindaraju, and D. Mandalapu. A framework for hand gesture recognition and spotting using sub-gesture modeling. In *Proceedings of the 20th International Conference on Pattern Recognition*, 2010. **(ICPR 2010)**
- C41. Y. Tang, S. Srihari, H. Kasiviswanathan, and **J. J. Corso**. Footwear print retrieval system for real crime scene marks. In *Proceedings of International Workshop on Computational Forensics*, 2010. **(IWCF 2010)**
- C40. A. Y. C. Chen and **J. J. Corso**. Propagating multi-class pixel labels throughout video frames. In *Proceedings of Western New York Image Processing Workshop*, 2010. **(WNYIPW 2010)**
- C39. J. A. Delmerico, **J. J. Corso**, and P. David. Boosting with stereo features for building facade detection on mobile platforms. In *Proceedings of Western New York Image Processing Workshop*, 2010. **(WNYIPW 2010)**
- C38. A. Y. C. Chen and **J. J. Corso**. On the effects of normalization in adaptive MRF hierarchies. In *Proceedings of ComplImage '10—Computational Modeling of Objects Presented in Images*, 2010.
- C37. R. S. Alomari, **J. J. Corso**, V. Chaudhary, and G. Dhillon. Automatic diagnosis of lumbar disc herniation using shape and appearance features from mri. In *Proceedings of SPIE Conference on Medical Imaging*, 2010. **(SPIE 2010)**
- C36. R. Rodrigues, G. Schroeder, **J. J. Corso**, and V. Govindaraju. Unconstrained face recognition using MRF priors and manifold traversing. In *Proceedings of IEEE International Conference on Biometrics: Theory, Applications, Systems*, 2009. **(BTAS 2009)**
- C35. Y. Tao, L. Lu, M. Dewan, A. Y. C. Chen, **J. J. Corso**, J. Xuan, M. Salganicoff, and A. Krishnan. Multi-level ground glass nodule detection and segmentation in ct lung images. In *Proceedings of Medical Image Computing and Computer Aided Intervention (MICCAI)*, volume LNCS 5762, pages 715–723, 2009. **(MICCAI 2009)**
- C34. T. J. Burns and **J. J. Corso**. Robust unsupervised segmentation of degraded document images with topic models. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, 2009. **(IEEE CVPR 2009)**
- C33. H. Z. Girgis, **J. J. Corso**, and D. Fischer. On-line hierarchy of general linear models for selecting and ranking the best predicted protein structures. In *Proceedings of IEEE Conference on Engineering in Medicine and Biology*, volume 1, pages 4949–4953, 2009. **(EMBS 2009)**

- C32. R. S. Alomari, **J. J. Corso**, V. Chaudhary, and G. Dhillon. Desiccation diagnosis in lumbar discs from clinical mri with a probabilistic model. In *Proceedings of 2009 IEEE International Symposium on Biomedical Imaging*, 2009. **(ISBI 2009)**
- C31. R. S. Alomari, **J. J. Corso**, V. Chaudhary, and G. Dhillon. Abnormality detection in lumbar discs from clinical mr images with a probabilistic model. In *Proceedings of 23rd International Congress and Exhibition on Computer Assisted Radiology and Surgery (CARS 2009)*, 2009. **(CARS 2009)**
- C30. P. Noël, J. Xu, K. R. Hoffmann, and **J. J. Corso**. Geometric tomography: a limited-view approach for computed tomography. In *Proceedings of the 25th Annual Symposium on Computational Geometry*, 2009. **(ASCG 2009)**
- C29. C. S. Hoeflich and **J. J. Corso**. Segmentation of 2D Gel Electrophoresis Spots using a Markov Random Field. In *Proceedings of SPIE Conference on Medical Imaging*, 2009. **(SPIE 2009)**
- C28. S. Seshamani, M. D. Smith, **J. J. Corso**, M. O. Filipovich, A. Natarajan, and G. D. Hager. Direct Global Adjustment Methods for Endoscopic Mosaicking. In *Proceedings of SPIE Conference on Medical Imaging*, 2009. **(SPIE 2009)**
- C27. P. B. Noël, **J. J. Corso**, J. Xu, K. R. Hoffmann, S. Schafer, and A. Walczak. Reconstruction from a Flexible Number of Projections in Cone-Beam Computed Tomography via Active Shape Models. In *Proceedings of SPIE Conference on Medical Imaging*, 2009. **(SPIE 2009)**
- C26. P. B. Noël, J. Xu, K. R. Hoffmann, **J. J. Corso**, S. Schafer, and A. Walczak. High Contrast Artifact Reduction in Cone Beam Computed Tomography by Using Geometric Techniques. In *Proceedings of SPIE Conference on Medical Imaging*, 2009. **(SPIE 2009)**
- C25. A. Y. C. Chen, **J. J. Corso**, and L. Wang. HOPS: Efficient region labeling using higher order proxy neighborhoods. In *Proceedings of International Conference on Pattern Recognition*, 2008. **(ICPR 2008)**
- C24. J. Li, S. Tulyakov, F. Farooq, **J. J. Corso**, and V. Govindaraju. Integrating minutiae based fingerprint matching with local mutual information. In *Proceedings of International Conference on Pattern Recognition*, 2008. **(ICPR 2008)**
- C23. **J. J. Corso**, R. S. Alomari, and V. Chaudhary. Lumbar disc localization and labeling with a probabilistic model on both pixel and object features. In *Proceedings of Medical Image Computing and Computer Aided Intervention (MICCAI)*, volume LNCS 5241 Part 1, pages 202–210, 2008. **(MICCAI 2008)**
- C22. I. Nwogu and **J. J. Corso**. Exploratory identification of image-based bio-markers for solid mass pulmonary tumors. In *Proceedings of Medical Image Computing and Computer Aided Intervention (MICCAI)*, volume LNCS 5241, Part 1, pages 612–619, 2008. **(MICCAI 2008)**
- C21. **J. J. Corso**. Discriminative Modeling by Boosting on Multilevel Aggregates. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, 2008. **(IEEE CVPR 2008)**
- C20. **J. J. Corso**, A. Yuille, and Z. Tu. Graph-Shifts: Natural Image Labeling by Dynamic Hierarchical Computing. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, 2008. **(IEEE CVPR 2008)**
- C19. I. Nwogu and **J. J. Corso**. $(BP)^2$: Beyond Pairwise Belief Propagation, Labeling by Approximating Kikuchi Free Energies. In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, 2008. **(IEEE CVPR 2008)**
- C18. **J. J. Corso**, Z. Tu, and A. Yuille. MRF Labeling with a Graph-Shifts Algorithm. In *Proceedings of International Workshop on Combinatorial Image Analysis*, volume LNCS 4958, pages 172–184, 2008. **(IWCIA 2008)**
- C17. I. Nwogu and **J. J. Corso**. Labeling irregular graphs with belief propagation. In *Proceedings of International Workshop on Combinatorial Image Analysis*, volume LNCS 4958, pages 295–305, 2008. **(IWCIA 2008)**
- C16. P. B. Noël, A. Walczak, K. R. Hoffmann, J. Xu, **J. J. Corso**, and S. Schafer. Clinical Evaluation of GPU-Based Cone Beam Computed Tomography. In *Proceedings of High-Performance Medical Image Computing and Computer-Aided Intervention (HP-MICCAI)*, 2008. **(HP-MICCAI 2008)**
- C15. S. Dube, **J. J. Corso**, A. Yuille, T. F. Cloughesy, S. El-Saden, and U. Sinha. Hierarchical Segmentation of Malignant Gliomas Via Integrated Contextual Filter Response. In *Proceedings of SPIE Conference on Medical Imaging*, 2008. **(SPIE 2008)**
- C14. **J. J. Corso**, A. L. Yuille, N. L. Sicotte, and A. Toga. Detection and Segmentation of Patho-

- logical Structures by the Extended Graph-Shifts Algorithm. In *Proceedings of Medical Image Computing and Computer Aided Intervention (MICCAI)*, 2007. **(MICCAI 2007)**
- C13. **J. J. Corso**, Z. Tu, A. Yuille, and A. W. Toga. Segmentation of Sub-Cortical Structures by the Graph-Shifts Algorithm. In *Proceedings of Information Processing in Medical Imaging (IPMI)*, volume LNCS 4584, pages 183–197, 2007. **(IPMI 2007)**
- C12. **J. J. Corso**, E. Sharon, and A. L. Yuille. Multilevel Segmentation and Integrated Bayesian Model Classification with an Application to Brain Tumor Segmentation. In *Proceedings of Medical Image Computing and Computer Aided Intervention (MICCAI)*, volume 2, pages 790–798, 2006. **(MICCAI 2006)**
- C11. **J. J. Corso** and G. D. Hager. Coherent Regions for Concise and Stable Image Description . In *Proceedings of IEEE Conference on Computer Vision and Pattern Recognition*, volume 2, pages 184–190, 2005. **(IEEE CVPR 2005)**
- C10. **J. J. Corso**, M. Dewan, and G. D. Hager. Image Segmentation Through Energy Minimization Based Subspace Fusion. In *Proceedings of 17th International Conference on Pattern Recognition (ICPR 2004)*, 2004. **(ICPR 2004)**
- C9. W. W. Lau, N. A. Ramey, **J. J. Corso**, N. Thakor, and G. D. Hager. Stereo-Based Endoscopic Tracking of Cardiac Surface Deformation. In *Proceedings of Seventh International Conference on Medical Image Computing and Computer-Assisted Intervention (MICCAI)*, 2004. **(MICCAI 2004)**
- C8. N. Ramey, **J. J. Corso**, W. W. Lau, D. Burschka, and G. D. Hager. Real Time 3D Surface Tracking and Its Applications. In *Proceedings of Workshop on Real-time 3D Sensors and Their Use (at CVPR 2004)*, 2004. **(CVPR RT3D 2004)**
- C7. G. Ye, **J. J. Corso**, and G. D. Hager. Gesture Recognition Using 3D Appearance and Motion Features. In *Proceedings of Workshop on Real-time Vision for Human-Computer Interaction (at CVPR 2004)*, 2004. **(CVPR V4HCI 2004)**
- C6. G. Ye, **J. J. Corso**, G. D. Hager, and A. M. Okamura. VisHap: Augmented Reality Combining Haptics and Vision. In *Proceedings of IEEE International Conference on Systems, Man and Cybernetics*, 2003. **(IEEE SMC 2003)**
- C5. **J. J. Corso**, D. Burschka, and G. D. Hager. Direct Plane Tracking in Stereo Image for Mobile Navigation. In *Proceedings of International Conference on Robotics and Automation*, 2003. **(ICRA 2003)**
- C4. G. Ye, **J. J. Corso**, D. Burschka, and G. D. Hager. VICs: A Modular Vision-Based HCI Framework. In *Proceedings of 3rd International Conference on Computer Vision Systems*, pages 257–267, 2003. **(ICVS 2003)**
- C3. **J. J. Corso**, D. Burschka, and G. D. Hager. The 4DT: Unencumbered HCI With VICs. In *Proceedings of CVPRHCI*, 2003. **(CVPR HCI 2003)**
- C2. J. Leven, **J. J. Corso**, J. D. Cohen, and S. Kumar. Interactive Visualization of Unstructured Grids Using Hierarchical 3D Textures. In *Proceedings of IEEE/SIGGRAPH Symposium on Volume Visualization and Graphics 2002*, pages 37–44, 2002. **(IEEE VOLVIS 2003)**
- C1. **J. J. Corso**, J. Chhugani, and A. Okamura. Interactive Haptic Rendering of Deformable Surfaces Based on the Medial Axis Transform. In *Eurohaptics*, pages 92–98, 2002. **(EURO-HAPTICS 2003)**

BOOK CHAPTERS AND THESES

- B4. S. Dube, **J. J. Corso**, T. F. Cloughesy, S. El-Saden, A. Yuille, and U. Sinha. *Data Mining Systems Analysis and Optimization in Biomedicine*, chapter Automated MR Image Processing and Analysis of Malignant Brain Tumors: Enabling Technology for Data Mining. American Institute of Physics, 2007.
- B3. **J. J. Corso**. *Techniques for Vision-Based Human-Computer Interaction*. PhD thesis, The Johns Hopkins University, 2005.
- B2. G. Ye, **J. J. Corso**, and G. D. Hager. *Real-Time Vision for Human-Computer Interaction*, chapter 7: Visual Modeling of Dynamic Gestures Using 3D Appearance and Motion Features, pages 103–120. Springer-Verlag, 2005.
- B1. **J. J. Corso**. Vision-Based Techniques for Dynamic, Collaborative Mixed-Realities. In B. J. Thompson, editor, *Research Papers of the Link Foundation Fellows*, volume 4. University of Rochester Press, 2004. Invited Report for Link Foundation Fellowship.

TECHNICAL REPORTS AND OTHER PAPERS (NOT PEER-REVIEWED)

- R12. C. S. Lea and **J. J. Corso**. Efficient hierarchical markov random fields for object detection on a mobile robot. Technical Report 1111.1599v1, arXiv, November 2011.
- R11. Y. Miao and **J. J. Corso**. Hamiltonian streamline guided feature extraction with applications to face detection. Technical Report 1108.3525v1, arXiv, August 2011.
- R10. A. Perera, S. Oh, M. Leotta, I. Kim, B. Byun, C.-H. Lee, S. McCloskey, J. Liu, B. Miller, Z. F. Huang, A. Vahdat, W. Yang, G. Mori, K. Tang, D. Koller, L. Fei-Fei, K. Li, G. Chen, **J. J. Corso**, Y. Fu, and R. K. Srihari. GENIE TRECVID2011 multimedia event detection: Late-fusion approaches to combine multiple audio-visual features. In *NIST TRECVID Workshop*, 2011.
- R9. H. Girgis and **J. J. Corso**. STP: The Sample-Train-Predict Algorithm and Its Application to Protein Structure Meta-Selection. Technical Report 2008-16, University at Buffalo SUNY, 2008.
- R8. I. Nwogu, **J. J. Corso**, and T. Bittner. The design of an ontology-enhanced anatomy labeler. Technical Report 2008-09, University at Buffalo SUNY, 2008.
- R7. C. Arnold, **J. J. Corso**, and A. Bui. An Unsupervised Approach to Automatic Image Annotation. In *NSF Biomedical Informatics Workshop: Expanding Secondary Use of Health Data*, 2007.
- R6. D. Burschka, G. Ye, **J. J. Corso**, and G. D. Hager. A Practical Approach for Integrating Vision-Based Methods into Interactive 2D/3D Applications. Technical report, The Johns Hopkins University, 2005. CIRL Lab Technical Report CIRL-TR-05-01.
- R5. **J. J. Corso**, M. Dewan, and G. D. Hager. Image Segmentation Through Energy Minimization Based Subspace Fusion. Technical Report CIRL-TR-04-01, The Johns Hopkins University, 2004.
- R4. **J. J. Corso**, N. Ramey, and G. D. Hager. Stereo-Based Direct Surface Tracking with Deformable Parametric Models. Technical report, The Johns Hopkins University, 2003. CIRL Lab Technical Report 2003-02.
- R3. **J. J. Corso**, G. Ye, D. Burschka, and G. D. Hager. Software Systems for Vision-Based Spatial Interaction. In *Proceedings of 2002 Workshop on Intelligent Human Augmentation and Virtual Environments*, pages D-26 and D-56, 2002.
- R2. **J. J. Corso** and G. D. Hager. Planar Surface Tracking Using Direct Stereo. Technical report, The Johns Hopkins University, 2002. CIRL Lab Technical Report.
- R1. **J. J. Corso** and J. D. Cohen. Out-Of-Core Voxelization of Large Scalar Fields for Interactive Multiresolution Volume Rendering. Technical report, The Johns Hopkins University, 2002. Graphics Lab Technical Report.

FUNDING

TOTAL FUNDING: \$6,132,206 (\$5,222,386 as PI)

ACTIVE FUNDING

- F9. **Co-PI: Objective Imaging-Based Assessment of Smoking Behavior from Used Filters** \$164,313
 SOURCE: National Institutes of Health NCI 1 R21 CA160825-01 9/2011-9/2013
 COLLABORATORS: O'Connor (PI, Roswell Park)
 OBJECTIVE: The proposal seeks to refine our ability to quantify the smoking behavior through digital image analysis of cigarette filters.
- F8. **PI: Two-Rank Mobile Robot Fleet for Swarm Surveillance, Warfighter Assistance, and other Army-related Research and Research-Related Education** \$250,000
 SOURCE: Army Research Office DURIP 9/2011-9/2012
 COLLABORATORS: Demirbas (CSE), Fu (CSE), Krovi (MAE), Nagi (MAE)
 OBJECTIVE: The basic goal is to enhance the DoD's capabilities for using fleets and swarms of ground-based sensor-rich unmanned and autonomous mobile robots (UGVs).
- F7. **PI: Comprehensive Object Detection Library for Large-Scale Image Analytics** \$190,975
 SOURCE: Naval Postgraduate School 5/2011-10/2012
 OBJECTIVE: The goal of the proposed work is to build a comprehensive object detection library and evaluate the methods for large-scale image sets.
- F6. **PI: GBS: Guidance By Semantics—Using High-Level Visual Inference to Improve Vision-based Mobile Robot Localization** \$150,000
 SOURCE: Army Research Office Young Investigator Program 6/2011-6/2014

OBJECTIVE: The goal is to investigate how semantic perception can be used to improve the accuracy, speed, and robustness of vision-based localization of mobile robot platforms.

- F5. **PI:** *Ontology, Event Agents and Event Recounting for ALADDIN* \$999,469
SOURCE: IARPA (sub from Kitware, Inc.) 3/2011-3/2016
COLLABORATORS: Fu (CSE) and R. Srihari (CSE)
OBJECTIVE: The goal of this project is to improve the representation and indexing of objects and events in large-scale video analysis by efficiently encoding the low-level perceptual entities in the video and grounding them with rich high-level semantics.
- F4. **PI:** *ISTARE: Intelligent Spatio-Temporal Activity Reasoning Engine* \$2,208,368
SOURCE: DARPA Mind's Eye Program 9/2010-8/2013
COLLABORATORS: Fu (CSE), Ceusters (Psychiatry), Krovi (MAE), Petropoulos (CSE)
OBJECTIVE: The goal of this proposal is a development of a methodology for representation, learning, recognition of and reasoning over activities in persistent surveillance videos.
- F3. **PI:** *Semantic Video Summarization With Ontology-Driven Probabilistic Inference on Massive Multimedia Collections* \$357,080
SOURCE: CIA/IC Postdoc Fellowship Program 7/2010-7/2013
OBJECTIVE: The main goal of the proposal is to advance the understanding of how probabilistic ontologies of semantic entities and entity-entity relationships can drive inference for semantic summarization of content in massive video collections.
- F2. **PI:** *ACE – Active Clustering for Exploitation and Defense Forensics* \$399,780
SOURCE: DARPA CSSG Phase II 6/2010-6/2012
OBJECTIVE: The main objective is to investigate how active clustering can be used to induce high-level models of phenomena in video with the help of a user.
- F1. **PI:** *CAREER: Generalized Image Understanding with Probabilistic Ontologies and Dynamic Adaptive Graph Hierarchies* \$539,086
SOURCE: National Science Foundation CAREER Program 7/2009-7/2014
OBJECTIVE: The major research goal is to investigate a unified model of image representation integrating probabilistic methods, machine learning, probabilistic ontologies, and dynamic adaptive graphs to advance our ability to solve the image understanding problem.

PAST FUNDING

- E5. **PI:** *Probabilistic Ontology Induction for Generalized Video Understanding* \$99,670
SOURCE: DARPA CSSG Phase I 4/2009-7/2010
OBJECTIVE: The major goal is to develop the foundational models for learning high-level semantic representations of objects from video data, automatically and unsupervisedly.
- E4. **Co-PI:** *II-NEW: Acquisition of BCI - A Biomedical Computing Infrastructure* \$588,554
SOURCE: National Science Foundation CRI 9/2010-9/2011
COLLABORATORS: Chaudhary (PI, CSE), Hoffmann (NS), Krovi (MAE), Furlani (CCR)
OBJECTIVE: The major goal of this project is to establish a state-of-the-art computing infrastructure for memory- and compute-bound problems in biomedicine.
- E3. **Co-PI:** *Multimodal Command-and-Control By Integrating Two-Handed Gestures and Speech* \$129,953
SOURCE: Hewlett Packard Labs Innovation Research Program 8/2008-8/2010
COLLABORATORS: Govindaraju (PI)
OBJECTIVE: The major goal of this project is to integrate multimodal processing into robust gesture recognition.
- E2. **PI:** *Digital Imaging of Cigarette Filters* \$27,958
SOURCE: Health Research, Inc. 9/2009-12/2009
OBJECTIVE: The major goal of this project is to develop improved image analysis techniques for quantifying the properties of cigarette filters in digital images.
- E1. **Co-PI:** *Reconstructing CT Images from a Limited Number of Projections* \$27,000
SOURCE: UB Interdisciplinary Research Development Fund
COLLABORATORS: Xu (PI, CSE) and Hoffman (NS)
OBJECTIVE: This project explores how redundant information in different projections can be combined with a priori knowledge of the anatomy to reduce dosage while maintaining high quality reconstructions.

AFFILIATIONS	Member , Association for the Advancement of Artificial Intelligence (AAAI)	2011-PRESENT
	Member , Mathematical Association of America (MAA)	2005-PRESENT
	Member , IEEE Robotics and Automation Society	2003-2005
	Member , Upsilon Pi Epsilon, Computer Science Honor Society	1999-PRESENT
	Member , Alpha Sigma Nu, National Jesuit Honor Society	1999-PRESENT
	Member , Association of Computing Machinery (ACM)	1998-PRESENT
	Member , IEEE Computer Society (IEEE)	1998-PRESENT
SERVICE	EDITORSHIP	
	* Associate Editor , Computer Methods and Programs in Biomedicine <i>Published by Elsevier</i>	9/2009-PRESENT
	CONFERENCE AND WORKSHOP ORGANIZATION	
	* Student Activities Chair , IEEE Conf. on Computer Vision and Pattern Recognition	2012
	* Organizing Committee , Joint Workshop on High-Performance and Distributed Computing for Medical Imaging (HP-MICCAI/MICCAI-DCI)	2011
	* Organizing Committee , High-Performance MICCAI <i>Jointly with Chaudhary (UB), Gong (IBM), Blezek (Mayo), and Kulikowski (Rutgers)</i>	2010
	* Organizing Committee , High-Performance MICCAI <i>Jointly with Chaudhary (UB) and Gong (IBM)</i>	2008
	SENIOR PROGRAM COMMITTEE	
	* Area Chair , IEEE Conf. on Computer Vision and Pattern Recognition	2012
	PROGRAM COMMITTEE AND CONFERENCE REVIEWER	
	* European Conference on Computer Vision	
	* IEEE Conference on Computer Vision and Pattern Recognition	
	* IEEE Conference on Robotics and Automation	
	* IEEE/RSJ International Conference on Intelligent Robots and Systems	
	* IEEE International Conference on Computer Vision	
	* International Conference on Multimedia and Expo	
	* Medical Image Computing and Computer Aided Intervention. <i>Above, years are not given for readability; service has been steady for most of these since 2006.</i>	
	* IEEE International Conference on Semantic Computing (ICSC)	2011
	* Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)	2011
	* Int'l Workshop on Stochastic Image Grammars (SIG-11, at ICCV)	2011
	* IEEE International Conference on Semantic Computing (ICSC)	2010
	* IEEE Workshop on Mobile Vision (at ICCV)	2011
	* IEEE Workshop on Mobile Vision (at CVPR)	2010
	* Workshop on Probabilistic, Models for Medical Image Analysis (at MICCAI)	2009
	* Int'l Workshop on Stochastic Image Grammars (SIG-09, at CVPR 2009)	2009
	* Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)	2009
	* IEEE 8th Intl Symposium on Signal Processing and Information Technology (ISSPIT)	2008
	* Energy Minimization Methods in Computer Vision and Pattern Recognition (EMMCVPR)	2007
	* IEEE 7th Int'l Symposium on BioInformatics and BioEngineering (BIBE)	2007
	JOURNAL REVIEWER	
	* ACM Computing Reviews	
	* Computer Methods and Programs in Biomedicine	
	* Computer Vision and Image Understanding	
	* IEEE Multimedia	
	* IEEE Signal Processing Letters	
	* IEEE Transactions on Biomedical Engineering	
	* IEEE Transactions on Image Processing	
	* IEEE Transactions on Information Technology in Biomedicine	
	* IEEE Transactions on Knowledge and Data Engineering	
	* IEEE Transactions on Medical Imaging	
	* IEEE Transactions on Multimedia	
	* IEEE Transactions on Pattern Analysis and Machine Intelligence	
	* IEEE Transactions on Systems, Man, and Cybernetics	
	* Image and Vision Computing	

- * International Journal of Computer Assisted Radiology and Surgery
- * International Journal of Computer Vision
- * Machine Vision and Applications
- * Medical Physics
- * Neuro Image
- * Pattern Recognition
- * Pattern Recognition Letters

PANELIST

- * National Science Foundation Panel/Reviewer (CISE/IIS) 2009,2011-12
- * Technology Foundation STW 2009
A Dutch funding agency for academic research in the field of applied sciences

SUNY AT BUFFALO COMMITTEES

- * Artificial Intelligence Area Coordinator 2011-PRESENT
- * Faculty Search Committee 2010-PRESENT
- * Graduate Studies Committee 2008-PRESENT
- * Distinguished Speaker Series Committee 2010
- * Brochure and Website Committee 2010
- * Colloquium Committee 2009
- * Graduate Admissions Committee 2008-2009

INVITED TALKS

- Graph-Shifts: Dynamic Hierarchical Energy Minimization for Segmentation and Classification.
- GE Research 10/2010
 - University of California, San Diego, Computer Science and Engineering 9/2010
 - Army Research Labs CISD 10/2010
 - Johns Hopkins University, Computer Science 5/2009
 - Siemens Medical Solutions 12/2008
 - Massachusetts Institute of Technology, CSAIL 11/2008
 - SUNY at Buffalo, Computer Science and Engineering 3/2007
- Bayesian Machine Intelligence Research at Buffalo
- ITT Space Systems Division 2/2009
 - MTM Interactive 6/2008
- Multilevel Image Segmentation and Integrated Bayesian Model Classification.
- Stony Brook University, Computer Science 10/2006
 - IBM TJ Watson Research Center 10/2006
 - Rutgers University, Center for BioImaging and Modeling 10/2006
 - Siemens Corporate Research 10/2006
 - Vanderbilt Institute for Imaging Science 7/2006
 - UCLA Laboratory of Neuroimaging SIG-STAT Meeting 3/2006
 - UCLA Statistics Seminar Series 4/2006
 - Johns Hopkins University, ERC CISST 5/2006
- Coherent Image Regions
- UCLA Medical Imaging Informatics 5/2005

TEACHING

SUNY AT BUFFALO, COMPUTER SCIENCE AND ENGINEERING

CSE 455/555 Introduction to Pattern Recognition

Cross-listed undergraduate graduate course.

- Spring 2012: Enrollment 73
- Spring 2011: Enrollment 60
- Spring 2010: Enrollment 35
- Spring 2009: Enrollment 29

CSE 672 Bayesian Vision

New upper-level graduate course.

- Fall 2010: Enrollment 12
- Spring 2009: Enrollment 8

CSE 642 Techniques in AI: Vision for HCI

- Fall 2009: Enrollment 8

CSE Seminars

- Fall 2011: Readings in Computer Vision and Machine Learning
- Fall 2010: Readings in Video Analysis

- Fall 2009: Readings in Image Semantics
- Fall 2008: Readings in Pattern Theory
- Fall 2007: Readings in Medical Image Segmentation

PRIOR EXPERIENCE AS A POSTDOC AND GRADUATE STUDENT

Object-Oriented Methods in Software Engineering - UCLA BIOMED 223C, Spring 2006.

Research Experience for Undergraduates Mentorship - Luz Molinelli, Summer 2005.

Project: Retinal disease diagnosis through multidimensional histogram analysis.

Research Experience for Undergraduates Mentorship - Ravi Mody, Summer 2004.

Project: Machine learning to track hand postures.

Guest Lecturer - Computer Vision, Cameras and Calibration, Dr. Gregory Hager, Fall 2002.

Teaching Assistant - Computer Vision, Dr. Gregory Hager, Fall 2001. Duties included holding weekly office hours, grading homeworks and projects, and preparing review notes.

Teaching Assistant - Data Structures, Dr. Subodh Kumar in Fall 2000 and Dr. Jonathan Cohen in Spring 2001. Duties included managing a team of 5 course assistants, holding weekly office hours, grading projects and exams, and holding review sessions.

STUDENT ADVISING PH.D. STUDENTS

D10. Liang Zhao	EXPECTED SPRING 2016
D9. Ran Xu	EXPECTED SPRING 2015
D8. Gang Chen	EXPECTED SPRING 2015
D7. David Johnson	EXPECTED SPRING 2015
D6. Chenliang Xu	EXPECTED SPRING 2015
D5. Jeffrey A. Delmerico	EXPECTED SPRING 2013
D4. Kevin R. Keane	EXPECTED SPRING 2013
D3. Caiming Xiong	EXPECTED SPRING 2013
D2. Albert Y. C. Chen	EXPECTED SPRING 2012
D1. Ifeoma Nwogu, Ph.D.	8/2009
<i>Jointly advised with Prof. Venu Govindaraju</i>	
THESIS: <i>An Ontology Driven Probabilistic Methodology for Image Understanding</i>	
PLACEMENT: Dr. Nwogu is currently an NSF Computing Innovation Fellow at the University of Rochester.	

M.S.E. STUDENTS

M8. Duygu Sarikaya	EXPECTED SPRING 2012
M7. Ananth Sadanand	EXPECTED FALL 2011
M6. Sagar Waghmare	EXPECTED FALL 2011
M5. Xin Li, M.S.E.	8/2011
THESIS: <i>Key-Part Detection Using Boundary-Regional Codebook</i>	
M4. Yingjie Miao, M.S.E.	6/2011
PROJECT: <i>Hamiltonian Streamline Guided Feature Extraction with Application to Face Detection</i>	
M3. Timothy J. Burns, M.S.E.	6/2010
PROJECT: <i>Document Image Segmentation and Labeling with Topic Models</i>	
M2. Dipankar Das, M.S.E.	12/2009
THESIS: <i>Hierarchical Multiple Instance Learning for Object Detection</i>	
M1. Chris Hoeflich, M.S.E.	12/2008
PROJECT: <i>Segmentation of 2D Gel Electrophoresis Spots Using a Markov Random Field.</i>	

CURRENT B.S. STUDENTS

In the capacity that I mentor them in research.

U6. Nick DiRienzo	EXPECTED SPRING 2015
U5. Philip Rosebrough	EXPECTED SPRING 2013
U4. Steven Hsieh	EXPECTED SPRING 2012
U3. Colin Lea, B.S.	6/2011

- U2. Alexander Haynie, B.S. 6/2011
 U1. Andrew Schlackman, B.S. 6/2009

PH.D. AND M.S.E. COMMITTEE MEMBERSHIP

Students for whom I am not the primary advisor.

- Z12. Jingteng Xue, Ph.D. Candidate, Advisor: Prof. Chang Wen Chen
 Z11. Liang Ge, Ph.D. Candidate, Advisor: Prof. Aidong Zhang
 Z10. Wenyuan Yin, Ph.D. Candidate, Advisor: Prof. Chang Wen Chen
 Z9. Yi Tang, Ph.D. Candidate, Advisor: Prof. Sargur Srihari
 Z8. Chang Su, Ph.D. Candidate, Advisor: Prof. Sargur Srihari
 Z7. Ricardo Rodrigues, Ph.D. GRANTED SUMMER 2011
 ADVISOR: Prof. Venu Govindaraju
Face Modeling and Biometric Anti-Spoofing using Probability Distribution Transfer Learning
 Z6. Anh Ngoc Le, Ph.D. GRANTED SPRING 2011
 ADVISOR: Prof. Hung Ngo.
On the Data Flow Masquerading Problem
 Z5. Xujun Peng, Ph.D. GRANTED FALL 2010
 ADVISOR: Prof. Venu Govindaraju.
Probabilistic Random Field Based Text Identification From Annotated Machine Printed Documents
 Z4. Gabriel Terajanu, Ph.D. GRANTED SPRING 2010
 ADVISOR: Prof. Peter Scott
Towards a Decision-Centric Framework for Uncertainty Propagation and Data Assimilation
 Z3. Bhaskar Purkayastha, M.S.E. GRANTED FALL 2009
 ADVISOR: Prof. Venu Govindaraju
Integrating Gesture Recognition and Speech Recognition in a Touch-Less Human Computer Interaction System.
 Z2. Peter Noël, Ph.D. GRANTED SUMMER 2009
 ADVISOR: Prof. Jinhui Xu
Geometric Algorithms for Three Dimensional Reconstruction in Medical Imaging
 Z1. Hani Z. Girgis, Ph.D. GRANTED SUMMER 2008
 ADVISOR: Prof. Daniel Fischer
Machine Learning Based Meta Approaches to Protein Structure Prediction

VISITING SCHOLARS

- V2. Srijan Kumar (IIT Kharagpur, Undergrad) SUMMER 2011
 V1. Digvijay Gagneja (IIT Kharagpur, Undergrad) SUMMER 2010

SOFTWARE

- Video Label Propagation** 2011
 Code to propagate an initial segmentation through a video sequence.
<http://www.cse.buffalo.edu/~aychen/LabelPropagation/propagatelabel.m>
MuleSeg 2006
 Extensible software for multilevel segmentation of 2D and 3D images based on an extended Segmentation by Weighted Aggregation algorithm using the Bayesian model-aware affinity
GUSTO 2002
 System for interactive, hierarchical rendering of large (out-of-core) 3D scalar fields, including unstructured grids, structured grids, and voxels. Jointly with Joshua Leven, Jonathan D. Cohen, and Subodh Kumar.
XVision2 2001
 Modular software architecture for real-time vision development. Jointly with Gregory Hager, Darius Burschka, Sam Lang, and Xiangtian Dai.

INDUSTRIAL
ACTIVITIES

Consultant for CUBRC, Inc. BUFFALO, NY 12/2009 - CURRENT
Various projects related to computer vision and image analysis for defense contracts.

Consultant for Ikona Medical Corp. LOS ANGELES, CA 9/2006 - CURRENT
Development of real-time medical video mosaicking algorithms and software.

Licensed Technology 9/2009
Licensed GPU based reconstruction algorithm for CT data to IRIS (Ionizing Radiation Imaging Systems LLC).

Co-Founder of NaviGuru.com LIVE 4/2006-11/2009
NaviGuru.com was a Web 2.0 site that unifies social networking with on-line mapping technology. It introduced a new form of web search called *visual query*.

Consultant for Infinite Biomedical Technologies, LLC BALTIMORE, MD 9/2006-9/2008
Development of image calibration and dewarping algorithm used in contact endoscopy.

Provisional Patent with Licensable Technology 2003
TITLE: 4D Touchpad - VICs based interface to computer systems.
INSTITUTE: Johns Hopkins University, Baltimore MD (JHU Ref. DM-4181).
CO-INVENTORS: Gregory D. Hager and Darius Burschka.
DESCRIPTION: The 4D Touchpad builds a shared perceptual space between the computer user and a set of video cameras. Perceptual gestures are used to directly interact with interface components. The video cameras sense and interpret the gestures and effect automation in the computer system.

PAST POSITIONS

Post-Doctoral Fellow LOS ANGELES, CA
Neuroscience and Statistics
University of California, Los Angeles 9/2006-11/2007
MENTORS: Drs. Alan Yuille and Arthur Toga
PRIMARY FOCUS: Develop automatic, efficient and robust segmentation and recognition techniques for computational neuroimaging problems with coupled statistical learning methods. Implement and deploy software tools based on these algorithms into the research community.

Post-Doctoral Fellow LOS ANGELES, CA
Radiological Sciences and Statistics
University of California, Los Angeles 9/2005-8/2006
MENTORS: Drs. Alan Yuille and Ricky Taira
PRIMARY FOCUS: Develop automatic segmentation and recognition techniques for medical imaging problems (e.g., brain tumor) by integrating bottom-up detection with top-down models. Quantify statistics of the models' shape and appearance to improve accuracy of diagnosis and treatment.

Research Assistant BALTIMORE, MD
Computer Science
The Johns Hopkins University 8/2001-8/2005
ADVISOR: Dr. Gregory D. Hager
PROJECT: Developing vision-based techniques enabling dynamic, complex interaction in immersive mixed-reality environments: the VICs project.

Research Intern PRINCETON, NJ
Siemens Corporate Research SUMMER 2003
MENTOR: Dr. Yakup Genc
PROJECT: Markerless, real-time camera pose tracking using stereo video for Augmented Reality.

Software Engineer BALTIMORE, MD
The Johns Hopkins University FALL 2001
DESCRIPTION: Contracted by the Department of Computer Science at The Johns Hopkins University to design and development a SQL-based database and WWW interface for the faculty recruitment/search process. The system remains in use today with no downtime.

Acting Director Of Technology BALTIMORE, MD
Bionic Box Inc. 5/2000-9/2000
DESCRIPTION: Responsible for all internal IT and managed all (participated in some) software development projects.

Software Engineer BALTIMORE, MD
Alexander and Tom, Inc. 9/1999-5/2000
URL: <http://www.alextom.com>
RESPONSIBILITIES: Design and development of a broad range of interactive systems including small video-games, database systems, websites, and custom interactive cd-roms.

Research Intern ROCKVILLE, MD

Earth Satellite Corporation 6/1999-12/2000
URL: <http://www.earthsat.com>
PROJECT: Modify and deploy NASA software for radiometrical and geometrical distortion correction for the Landsat 7 satellite.

Research Assistant BALTIMORE, MD
Computer Science
Loyola College in Maryland SPRING 1999
ADVISOR: Dr. Keith Gallagher
PROJECT: Development of an ISO 9000-3 compatible software project management tool.

Hauber Science Research Fellow BALTIMORE, MD
Computer Science
Loyola College in Maryland SUMMER 1998
ADVISOR: Dr. Roger Eastman
PROJECT: Development of an image-processing algorithm for robust registration of retinal nerve images for use in glaucoma diagnosis.

Database Programmer MANHATTAN, NY
Information Builders, Inc. SUMMER 1996, 1997 AND WINTER 1997
URL: <http://www.informationbuilders.com>
RESPONSIBILITIES: Fulfill internal database programming needs for information systems using their proprietary database language and development platforms (FOCUS).