

SINISA TODOROVIC

School of EECS
1148 Kelley Engineering Center
Oregon State University
Corvallis, OR 97330
Tel: (541) 737-7268, Fax: (541) 737-1300
<http://web.engr.oregonstate.edu/~sinisa>
sinisa@eecs.oregonstate.edu

EDUCATION

- **Ph.D.** in electrical and computer engineering, University of Florida, 2005
Dissertation: “Irregular-Structure Tree Models for Image Interpretation” – Algorithms for simultaneous learning of a Bayesian net structure and the associated pdf’s from data
Committee: Michael C. Nechyba (advisor), Jian Li, Antonio A. Arroyo, Dapeng Wu, Andrew Kurdila, Takeo Kanade (Carnegie Mellon University)
- **M.S.** in electrical and computer engineering, University of Florida, 2002
Thesis: “Statistical Modeling and Segmentation of Sky/Ground Images”
Committee: Michael C. Nechyba (advisor), Antonio A. Arroyo, Peter G. Ifju
- **B.S./M.S.** in electrical engineering, University of Belgrade, Serbia, 1994

GRANTS, AWARDS, AND HONORS

- NSF, \$380K, Co-Pi, 09/2008–09/2011
Title: “Discovery, Modeling and Recognition of Objects in Image Sets”
- TTCL, \$100K, Co-PI, 11/2007–10/2008
Title: “Machine Vision Inspection of Structural Railcar Components”
- NSF, \$100K, Co-PI, 08/2007–08/2008
Title: “Segmentation Trees and their Robust Matching as Core Technologies for Recognition”

AWARDS AND HONORS

- Outstanding Reviewer Award, ICCV 2007
- Jack Neubauer Best Paper Award in IEEE Transactions on Vehicular Technology, 2004
- Outstanding Academic Accomplishment, University of Florida, 2002, 2003

EMPLOYMENT

- 09/08–now: **Assistant Professor**, School of EECS, Oregon State University
- 05/05–08/08: **Postdoc**, Beckman Institute, University of Illinois at Urbana-Champaign
Collaboration with Prof. Narendra Ahuja: Multiscale image segmentation; Structural pattern recognition; Object/scene recognition; Texture classification and synthesis; Preparation of grant proposals; Machine vision for improving railcar safety-appliance inspection sponsored by Association of American Railroads; Helping Prof. Ahuja in his duties as Associate Editor of journal Computer Vision and Image Understanding

- 01/02–05/05: **Research Assistant**, University of Florida, ECE Department
Object segmentation, recognition, and tracking; Statistical generative models; Bayesian tree-structured models; Multiscale image analysis; Wavelets, ridgelets, curvelets; Vision-based guidance, control and flight stability of micro air vehicles at the Center for Micro Air Vehicle Research; Preparation of grant proposals
- 11/98–07/01: **Software Engineer**, Siemens
Digital switching systems; Instructor at Siemens Educational Center in Vienna, Austria

TEACHING

- Fall 08: CS 556 – Computer Vision, Oregon State University
- Spring 07: ECE 590 – Graduate Seminar Course in Computer Vision, UIUC

SEMINARS AND TALKS

- “Unsupervised Discovery, Modeling, and Recognition of Visual Categories” or “What do those Images Have in Common” (two titles on the same research)
 - Google Tech Talks, April 2008
 - Ricoh Innovations, Inc., April 2008
 - Department Colloquium, EECS Department, Oregon State University, January 2008
 - UCLA Statistics Speakers Series, Department of Statistics, UCLA, January 2008
 - VASC Seminar Series, Robotics Institute, Carnegie Mellon University, October 2007
 - PAML Seminar Series, Beckman Institute, UIUC, September 2007
- “Multiscale linear discriminant analysis and dynamic tree structured belief networks”
 - VisionFest 2004, GERC Eglin Air Force Base, Shalimar, FL, April 2004

ACADEMIC SERVICE

- Associate Editor:
 - Advances in Multimedia
- Program Committee Member/Reviewer:
 - IEEE Trans. Pattern Analysis Machine Intelligence, 2006 – now
 - IEEE Trans. Image Processing, 2006 – now
 - Computer Vision and Image Understanding, 2005 – now
 - Image and Vision Computing, 2006 – now
 - Statistical Analysis and Data Mining, 2008 –now
 - ICCV – IEEE Int. Conf. on Computer Vision, 2007
 - CVPR – IEEE Conf. Computer Vision Pattern Recognition, 2006, 2007, 2008
 - ECCV – European Conf. Computer Vision, 2008
 - ICPR – IAPR Int. Conf. Pattern Recognition, 2006, 2008
 - 3dRR-07 – 3D Representation for Recognition, ICCV Workshop, 2007
 - VISAPP – Int. Conf. Computer Vision Theory Applications, 2006, 2007, 2008
 - FG – IEEE Int. Conf. Automatic Face Gesture Recognition, 2006
 - ICRA – IEEE Conf. Robotics Automation, 2004
 - ICARCV – IEEE Int. Conf. Control Automation Robotics Vision, 2006
 - PSIVT – IEEE Pacific-Rim Symposium Image Video Technology, 2006
- Member, IEEE, since 2001

JOURNAL PUBLICATIONS

1. S. Todorovic and N. Ahuja, "Unsupervised category modeling, recognition and segmentation in images," *IEEE Trans. Pattern Analysis Machine Intell.*, preprint available at ieeexplore.ieee.org, 2008
2. S. Todorovic and N. Ahuja, "Region-based hierarchical image matching," *Int. J. Computer Vision*, vol. 78, no. 1, pp. 47-66, 2008
3. K. Lu, D. Wu, J. Fan, S. Todorovic, and A. Nucci, "Robust and efficient detection of DDoS attacks for large-scale internet," *Computer Networks*, vol. 51, no. 18, pp. 5036-5056, 2007
4. Y. Sun, S. Todorovic, J. Li, "Increasing the robustness of boosting algorithms within the linear programming framework," *J. VLSI Signal Processing*, vol. 48, no. 1-2, pp. 5-20, 2007
5. Y. Sun, Z. Liu, S. Todorovic, J. Li, "Adaptive boosting for synthetic aperture radar automatic target recognition," *IEEE Trans. Aerospace Electronic Systems*, vol. 43, issue 1, pp. 112-25, 2007
6. S. Todorovic and M. C. Nechyba, "Interpretation of complex scenes using dynamic tree-structure Bayesian networks," *Computer Vision Image Understanding*, vol. 106, issue 1, pp. 71-84, 2007
7. Y. Sun, S. Todorovic, J. Li, "Unifying multi-class AdaBoost algorithms with binary base learners under the margin framework," *Pattern Recognition Letters*, vol. 28, issue 5, pp. 631-43, 2007
8. Y. Sun, S. Todorovic, J. Li, "Reducing the overfitting of AdaBoost by controlling its data distribution skewness," *Int. J. Pattern Rec. Artificial Intell.*, vol. 20, no. 7, pp. 1093-116, 2006
9. S. Todorovic and M. C. Nechyba, "Dynamic trees for unsupervised segmentation and matching of image regions," *IEEE Trans. Pattern Analysis Machine Intell.*, vol. 27, no. 11, pp. 1762-77, 2005
10. S. Todorovic and M. C. Nechyba, "A vision system for intelligent mission profiles of Micro Air Vehicles," in *IEEE Trans. Vehicular Technology*, vol. 53, no. 6, pp. 1713-25, 2004, VTS Jack Neubauer Best Paper Award

SELECTED REFEREED CONFERENCE PUBLICATIONS

1. S. Todorovic and N. Ahuja, "Scale-invariant region-based hierarchical image matching," in *Proc. 19th Int. Conf. Pattern Recognition (ICPR)*, Tampa, FL, 2008, (oral presentation)
2. Y. Sun, S. Todorovic, and S. Goodison, "A feature selection algorithm capable of handling extremely large data dimensionality," in *Proc. SIAM Int. Conf. Data Mining (SDM)*, pp. 530-540, Atlanta, GA, 2008
3. S. Todorovic and N. Ahuja, "Learning subcategory relevances to the recognition of a category," in *Proc. IEEE Computer Vision Pattern Recognition (CVPR)*, Anchorage, AL, 2008
4. N. Ahuja and S. Todorovic, "Connected segmentation tree – a joint representation of region layout and hierarchy," in *Proc. IEEE Computer Vision Pattern Recognition (CVPR)*, Anchorage, AL, 2008
5. J. Edwards, J. Hart, S. Todorovic, C. Barkan, N. Ahuja, Z. Chua, N. Kocher, and J. Zeman, "Development of machine vision technology for railcar safety appliance inspection," in *Proc. Int. Heavy Haul Conference, Specialist Technical Session*, pp. 745-752, Kiruna, Sweden, 2007
6. B. Fried, C. Barkan, N. Ahuja, J. Hart, S. Todorovic, and N. Kocher, "Multispectral machine vision for improved undercarriage inspection of railroad rolling stock," in *Proc. Int. Heavy Haul Conference, Specialist Technical Session*, pp. 737-744, Kiruna, Sweden, 2007
7. N. Ahuja and S. Todorovic, "Extracting texels in 2.1D natural textures," in *Proc. IEEE Int. Conf. Computer Vision (ICCV)*, Rio de Janeiro, Brazil, 2007, (oral presentation)
8. N. Ahuja and S. Todorovic, "Learning the taxonomy and models of categories present in arbitrary images," in *Proc. IEEE Int. Conf. Computer Vision (ICCV)*, Rio de Janeiro, Brazil, 2007
9. S. Todorovic and N. Ahuja, "3D texture classification using the belief net of a segmentation tree," in *Proc. 18th Int. Conf. Pattern Recognition (ICPR)*, vol. 4, pp. 33-36, Hong Kong, China, 2006, (oral presentation)

10. S. Todorovic and N. Ahuja, "Extracting subimages of an unknown category from a set of images," in Proc. IEEE Computer Vision Pattern Recognition (CVPR), vol. 1, pp. 927-934, New York, NY, 2006, (oral presentation)
11. Y. Sun, S. Todorovic, J. Li, and D. Wu, "A robust linear programming based boosting algorithm," in Proc. 2005 IEEE Int. Workshop Machine Learning Signal Processing (MLSP), pp. 49- 54, Mystic, CT, 2005
12. Y. Sun, S. Todorovic, J. Li, and D. Wu, "Unifying the error-correcting and output-code AdaBoost within the margin framework," in Proc. 22nd Int. Conf. Machine Learning (ICML), vol. 119, pp. 872-879, Bonn, Germany, 2005
13. Y. Sun, Z. Liu, S. Todorovic, and J. Li, "SAR Automatic Target Recognition Using AdaBoost," in Proc. SPIE Tech. Sys. Defense Security, vol. 5808, pp. 282-293, Orlando, FL, 2005
14. S. Todorovic and M. C. Nechyba, "Detection of artificial structures in natural-scene images using dynamic trees," in Proc. 17th Int. Conf. Pattern Recognition (ICPR), vol. 1, pp. 35-39, Cambridge, U.K., 2004
15. S. Todorovic and M. C. Nechyba, "Interpretation of complex scenes using generative dynamicstructure models," in Proc. IEEE Computer Vision Pattern Recognition (CVPR), Generative-Model Based Vision (GMBV), Washington, D.C., 2004
16. S. Todorovic and M. C. Nechyba, "Towards intelligent mission profiles of Micro Air Vehicles: multiscale Viterbi classification," in Proc. 8th European Conf. Computer Vision (ECCV), vol. 2, pp. 178-189, Prague, Czech Republic, 2004
17. S. Todorovic and M. C. Nechyba, "Intelligent missions for MAVs: visual contexts for control, recognition and tracking," in Proc. IEEE Int. Conf. Robotics Automation (ICRA), vol. 2, pp. 1640- 1645, New Orleans, LA, 2004
18. S. Todorovic, M. C. Nechyba, and P. G. Ifju, "Sky/ground modeling for autonomous MAVs," in Proc. IEEE Int. Conf. Robotics Automation (ICRA), vol. 1, pp. 1422-1427, Taipei, Taiwan, 2003
19. S. Todorovic and M. C. Nechyba, "Multiresolution linear discriminant analysis: efficient extraction of geometrical structures in images," in Proc. IEEE Int. Conf. Image Processing (ICIP), vol. 1, pp. 1029-1032, Barcelona, Spain, 2003