

Kevin M. Nickels

Business Address

Engineering Science Department
715 Stadium Drive
Campus Box 64
San Antonio, TX 78212
(210) 999-7543

Home Address

19739 Encino Knoll
San Antonio, TX 78259
(210) 481-2610

E-mail: knickels@engr.trinity.edu

EDUCATION

Ph.D., Electrical and Computer Engineering University of Illinois, Urbana-Champaign, IL, 1998
Dissertation Title: "Model Based Object Tracking."

M.S., Electrical and Computer Engineering University of Illinois, Urbana-Champaign, IL, 1996
Thesis Title: "Textured Image Segmentation Using Markov Random Fields: Returning Multiple Segmentations."

B.S. with Distinction, Computer and Electrical Engineering Purdue University, West Lafayette, IN, 1993

EMPLOYMENT

2004 - present: Trinity University:
Associate Professor of Engineering Science

1998 - 2004: Trinity University:
Assistant Professor of Engineering Science

1993-1998: University of Illinois at Urbana-Champaign:
Research Assistant, Teaching Assistant & Course Instructor

TEACHING INTERESTS

Digital Logic Design & Boolean Algebra, Microcomputers, Controls, Circuit Analysis, Signals & Systems, Digital Signal Processing

RESEARCH INTERESTS

Vision for Mobile Robots, Image & Scene Analysis, Kalman & Optimal Filtering, Mobile Robotic Motion Planning & Execution

Education in Digital Design, Effective Classroom/Laboratory Teaching, Design-Oriented Education, Active Learning, Learning Modes/Styles

PROFESSIONAL MEMBERSHIPS

Member, American Society for Engineering Education (ASEE), since 1998

Senior Member, Institute of Electrical and Electronics Engineers (IEEE), Robotics & Automation, and Computer Societies, since 2003 (member since 1995)

HONORS AND AWARDS

Elected Senior Member of IEEE in 2003 (only 7% of IEEE members are elected to this level)

NASA-ASEE-USRA (National Aeronautics and Space Administration, American Society for Engineering Education, Universities Space Research Association) Summer Faculty Fellow in Aeronautics and Space Research, Engineering Directorate, Johnson Space Center, Houston. “Hand-Eye Calibration for Robonaut” (Summer 2003)

Best paper Award, in PIC II of 2002 ASEE Annual Conference for “Herding Cats: A case study of a capstone design course,” (with Paul Giolma, 2002)

NASA-ASEE-USRA (National Aeronautics and Space Administration, American Society for Engineering Education, Universities Space Research Association) Summer Faculty Fellow in Avionics Systems and Space Technology, Engineering and Science Directorate, Jet Propulsion Laboratory, Pasadena. “Fusion of LIDAR and stereo range data for JPL’s URBIE mobile robot” (Summer 2002)

NASA-ASEE (National Aeronautics and Space Administration, American Society for Engineering Education) Summer Faculty Fellow in Aeronautics and Space Research, Engineering Directorate, Johnson Space Center, Houston. “Vision System Stabilization for Mobile Robot Base and Ground Movement” (Summer 2000)

William Liston Zander Faculty Fellow - Trinity University (Summers of 1999, 2000, 2001)

GRANTS

“Kalman Filter-Based Sensor Fusion for Estimation of Mobile Robot Location and Orientation,” NASA JSC Summer Faculty Fellows Director’s Grant Program, 2000-2002, \$15,500.

“Improved Hand-Eye Calibration for Robonaut,” Trinity University Faculty Development Grant, 2004, \$7,000

PUBLICATIONS

REFEREED PUBLICATIONS IN COMPUTER VISION & ROBOTICS JOURNALS

“Estimating Uncertainty in SSD-Based Feature Tracking,” by Kevin Nickels and Seth Hutchinson, *Image and Vision Computing*, Vol. 20, 2002, pp. 47-58.

“Model-Based Tracking of Complex Articulated Objects”, by Kevin M. Nickels and Seth Hutchinson, *IEEE Transactions on Robotics and Automation*. Volume 17, Number 1, February 2001, pp. 28-36.

“Textured Image Segmentation: Returning Multiple Solutions,” by Kevin Nickels and Seth Hutchinson, *Image and Vision Computing*, Vol. 15, 1997, pp. 781-795.

REFEREED PUBLICATIONS IN COMPUTER VISION & ROBOTICS PROCEEDINGS

“Modified Stereo Camera Calibration Techniques for use in Robotic Vision,” by Kevin M. Nickels and Brandi C. House, abstract accepted to *Proceedings, 19th National Conference on Undergraduate Research*, April 21-23, 2005, Lexington Virginia

- “Fusion of Lidar and Stereo Range for Mobile Robots,” by Kevin Nickels, Andrés Castaño and Christopher Cianci, in *Proceedings, 11th International Conference on Advanced Robotics*, June 30 - July 3, 2003, University of Coimbra, Portugal, Vol. 1, pp. 65-70
- “Design of a low-power motion tracking system,” by Kevin Nickels, Jeffrey Graham, Christina Soontornvat, Luke Powell, Jason Frederick, and Chuck Divin, in *Proceedings, 11th International Conference on Advanced Robotics*, June 30 - July 3, 2003, University of Coimbra, Portugal, Vol. 1, pp. 83-87
- “Path following for a poorly controlled mobile robot,” by Kevin Nickels, in *Proceedings, 6th World Multiconference on Systemics, Cybernetics and Informatics*, July 14-18, 2002, Orlando, Florida, USA
- “Pan-tilt-vergence stereo heads for mobile robots: The use of software components in driver design,” by Kevin Nickels and Daniel DiPaolo, in *Proceedings, 5th World Multiconference on Systemics, Cybernetics and Informatics*, July 22-25, 2001, Orlando, Florida, USA, Volume VII, pp. 455-460.
- “Inertially Assisted Stereo Tracking for an Outdoor Rover,” by Kevin Nickels and Eric Huber, in *Proceedings, IEEE International Conference on Robotics and Automation*, May 21-26, 2001, Seoul, Korea, pp. 3078-3083.
- “Evaluation of feature-based room maps,” by Kevin Nickels and Michael Sutton, in *Proceedings, 4th World Multiconference on Systemics, Cybernetics and Informatics*, July 23-26, 2000, Orlando, Florida, USA, Volume IV, pp. 150-155.
- “Measurement error estimation for feature tracking,” by Kevin Nickels and Seth Hutchinson, in *Proceedings IEEE International Conference on Robotics and Automation*, May 10-15, 1999, Detroit, Michigan, pp. 3230-3235.
- “Development of a Visual Space-Mouse,” by Tobias Kurpjuhn, Kevin Nickels, Alexa Hauck, and Seth Hutchinson, in *Proceedings IEEE International Conference on Robotics and Automation*, May 10-15, 1999, Detroit, Michigan, pp. 2527-2532.
- “Weighting Observations: The use of Kinematic Models in Object Tracking,” by Kevin Nickels and Seth Hutchinson, in *Proceedings IEEE International Conference on Robotics and Automation*, May 16-20, 1998, Leuven, Belgium, pp. 1677-1682.

REFEREED PUBLICATIONS IN ENGINEERING EDUCATION PROCEEDINGS

- “What are the ”Fundamentals” of Modern Digital Logic Design? The evolving content of Trinity’s one-semester course in Digital Logic Design,” abstract accepted to *Proceedings 2005 American Society for Engineering Education - Gulf-Southwest Annual Meeting*, March 23-25, 2005, Corpus Christi, TX.
- “The impact on student learning of resubmission of work and flexible deadlines”, by Kevin Nickels and Mahbub Uddin, in *Proceedings 2003 American Society for Engineering Education - Gulf-Southwest Annual Meeting*, March 19-21, 2003, Arlington, TX.
- “Herding cats : a case study of a capstone design course,” by J. Paul Giolma and Kevin M. Nickels, in *Proceedings, 2002 American Society for Engineering Education Annual Conference, June 16-19, 2002, Montréal, Quebec, Canada*
- “Bridging the gap between discrete and programmable logic in introductory digital logic laboratories,” by Kevin Nickels, Farzan Aminian, and J. Paul Giolma, in *Proceedings, 2001 American Society for Engineering Education Annual Conference, June 24-27, 2001, Albuquerque, NM*

- “Pros and Cons of replacing discrete logic with programmable logic in introductory digital logic courses,” by Kevin Nickels, in *Proceedings 2000 American Society for Engineering Education Annual Conference, June 18-21, 2000, St. Louis, MO*
- “Do’s and Don’ts of Introducing Active Learning Techniques,” by Kevin Nickels, in *Proceedings 2000 American Society for Engineering Education Annual Conference, June 18-21, 2000, St. Louis, MO*
- “Using robots to teach non-engineers about science and technology,” by Kevin Nickels and J. Paul Giolma, in *Proceedings 2000 American Society for Engineering Education - Gulf-Southwest Annual Meeting, April 5-8, 2000, Las Cruces, New Mexico*
- “Change Agents: Immediately Implementable Teaching and Educational Hints from the Engineering Education Scholars Program,” by S. Courter, R. Lyle, K. Nickels, D. Noyce, A. Pearce, J. Reeves, L. Schaefer, R. Wickramasinghe, in *Proceedings 1999 American Society for Engineering Education Annual Conference June 20-23, 1999, Charlotte, North Carolina*

INVITED CONFERENCE PUBLICATIONS AND BOOK CHAPTERS

- “Integrated Object Models for Robust Visual Tracking”, by Kevin Nickels and Seth Hutchinson, in M. Vincze & G. Hager (Eds.), Robust Vision for Vision-Based Control of Motion (pp. 45-60) 1999 Piscataway, NJ: IEEE Press, Inc.
- “Integrated Object Models for Robust Visual Tracking”, by Kevin Nickels and Seth Hutchinson, in *Proceedings Workshop on Robust Vision for Vision-based Control of Motion*, in association with 1998 IEEE International Conference on Robotics and Automation, May 16-20, 1998, Leuven, Belgium.
- “Characterizing the Uncertainties in Point Feature Motion for Model-Based Object Tracking”, by Kevin M. Nickels and Seth Hutchinson, *Proc. Workshop on New Trends in Image-Based Robot Servicing*, in association with 1997 IEEE-RSJ International Conference on Intelligent Robots and Systems. Grenoble, France, pp. 53-63.

TECHNICAL REPORTS

- Kevin M. Nickels. “Hand-Eye Calibration for Robonaut,” In Research Reports - 2003 NASA/ASEE Summer Faculty Fellowship Program, NASA Contractor Report, 2003.
- Kevin M. Nickels. “Kalman Filter-Based Sensor Fusion for Estimation of Mobile Robot Location and Orientation,” In Research Reports - 2000 NASA JSC Summer Faculty Fellows Director’s Grant Program
- Kevin M. Nickels. “EVA Robotic Assistant Project: Platform Attitude Prediction,” In Research Reports - 2000 NASA/ASEE Summer Faculty Fellowship Program, NASA Contractor Report, 2000.
- Daniel DiPaolo (Kevin M. Nickels, Advisor). “Performance Evaluation and Software Design for EVA Robotic Assistant Stereo Vision Heads,” In Research Reports - 2000 NASA/ASEE Summer Faculty Fellowship Program, NASA Contractor Report, 2000.