

RESUME – Timothy C. Burg

PERSONAL DATA

Assistant Professor
Department of Electrical and Computer Engineering
Clemson University
Clemson, SC 29634-0915
(864) 656-1368

EDUCATION

Ph.D., Clemson University, 1996, Electrical Engineering
M.S., Clemson University, 1990, Electrical Engineering
B.S., University of Cincinnati, 1988, Electrical Engineering

PROFESSIONAL REGISTRATION

F.E. Certification, Ohio

PROFESSIONAL EXPERIENCE

Clemson University, Department of Electrical and Computer Engineering, Clemson, SC,
8/05 - pres, Assistant Professor of Electrical and Computer Engineering
Michelin Americas Research and Development Corporation, Greenville, SC, 7/00 – 7/05,
Research Engineer
SE Huffman Corporation, Clover, SC, 9/96 – 7/00, Control Engineer
Clemson University, Department of Electrical and Computer Engineering, Clemson, SC,
5/93 - 5/96 Research Assistant, 1/90 - 5/93, Teaching Assistant
General Electric, Louisville, KY, 4/87 - 9/87, Coop Engineer
Schneider Instrument, Cincinnati, OH, 4/86-1/87, Coop Engineer
Westinghouse Electric, Cincinnati, OH, 9/85 - 1/86, Coop Engineer

MEMBERSHIPS

Institute Electrical and Electronics Engineers (IEEE) (1987 - present): Senior Member
June 2009
Member, Sigma Xi, The Scientific Research Society (2007- present): Vice-president
(6/2007 – 7/2008), President (6/2008-7/2009)
Academy of Model Aeronautics (3/2007 - present)

PROFESSIONAL ACTIVITIES

Conferences

- Organizer and co-chair of “Biosensors” at the 2009 Society For Biomaterials Conference, San Antonio TX, April 2009.
- Session co-chair of “Adaptive Control” at the 47th IEEE Conference on Decision and Control, Cancun, Mexico, December 2008.

- Session co-chair of “FrC18 - Aerospace Modeling and Control” at the 45th IEEE Conference on Decision and Control, New Orleans, LA, 2007.
- Associate Editor, Bmesource (web portal for the biomedical technology design community), <http://www.bmesource.org>, 1/2006-1/2007.
- Sessions co-chairman of “Applications to Robotic Systems” at the American Control Conference, New York, NY, 2007.
- “Adaptive Control Applications” and “Nonlinear Control”, American Control Conference, 1995. “Mechanical Systems”, 34th IEEE Conference on Decision and Control, 1995.

Review Work (last 2 years)

2009

- National Institutes of Health (NIH), SBIB-V (58)R Challenge grant Panel #23, Internet Assisted Review, June 2009.
- IEEE Transactions on Automatic Control
- Automatica
- IEEE Conference on Decision and Control
- Nonlinear Dynamics

2008

- Louisiana EPSCoR - Pilot Funding for New Research (Pfund) Program, 2008
- European Journal of Control (2007)
- IEEE/ASME Transactions on Mechatronics (~~1 paper~~ 2008)
- Conference on Decision and Control

PUBLICATIONS

In Preparation

- Burg, T., Groff, R., Pepper, M., Jenkins, L., Parzel, C., Burg, K., “Ink-jet Printing for Precision Histological Staining”, *Journal of Histotechnology, est Nov, 2009*.
- Singapogu, R., Pagano, C., Burg, T., Dorn, P., Zacharia, R., “Kinesthetic Haptic Rendering in Virtual Environments: Perceiving Length by Haptic Attunement to the Inertia of Virtual Rods”, *IEEE Transactions on Haptics*, submitted January 2008, performed additional experiments, resubmit, (Oct 2009).
- Lee, D., Burg, T., Xian, B., Dawson, D., "Output Feedback Tracking Control of an Underactuated Quad-Rotor UAV", *IEEE Transactions on Automatic Control*, submitted 10/1/2008, rejected 3/2009, resubmit as a short technical paper, Nov 2009.
- Tatlicioglu, E., Xian, B., Dawson, D.M., Burg, T., “Adaptive Control of Flat MIMO Nonlinear Systems With Additive Disturbance”, *Automatica*, submit 3/2009, rewrite based on review comments and resubmit Nov 2009.

Books, Monographs, Book Chapters

1. Lee, D., Burg, T., Dawson, D., and Dorn, G., “Fly-The-Camera Perspective: Control of a Remotely Operated Quadrotor UAV and Camera Unit ”, *Aerial Vehicles*, edited by: T. Lam, I-Tech Publishing (<http://intechweb.org/books.php>), Vienna, Austria, EU, ISBN 978-953-7619-41-1, Chapter 8, pp 161-188, (January, 2009).

2. Dawson, D., Hu, J., and Burg, T., *Nonlinear Control of Electric Machinery*, 1st Edition (1998), Marcel Dekker, New York, NY.

Refereed Journal Publications

1. Burg, T., Parzel, C., Groff, R., Pepper, M., Burg, K., "Building Off-the-Shelf Tissue Engineered Composites", *Philosophical Transactions of the Royal Society A: Physical, Mathematical and Engineering Sciences*, invited paper to special issue entitled "Advanced Processing of Biomaterials", (submitted 8/2009).
2. Tatlicioglu, E., Dawson, D., Burg, T., Walker, I., McIntyre, M., "Coordination Control for Haptic and Teleoperator Systems", *International Journal of Robotics and Automation*, (accepted August 2009, in press).
3. Tatlicioglu, E., Braganza, D., Burg, T., Dawson, D., "Adaptive Control of Redundant Robot Manipulators with Sub-task Extensions", *Robotica*, **27(6)**, pp. 873-881, (October, 2009). {doi:10.1017/S0263574708005274}
4. Parzel, C.A., Groff, R., Burg, T., Hill, A.M., Pepper, M., Burg, K., "EDTA Enhances High-Throughput Two-Dimensional BioPrinting by Inhibiting Salt-Scaling and Cell Aggregation at the Nozzle Surface", *Journal of Tissue Engineering and Regenerative Medicine*, **3(4)**, Pages 260 – 268, (June, 2009). {doi: 10.1002/term.162}
5. Chen, J. Dawson, D., Salah, M., Burg, T., "Cooperative control of multiple vehicles with limited sensing", *International Journal of Adaptive Control and Signal Processing*, **21(2-3)**, pp. 115-131, (2007). {doi: 10.1002/acs.921}.
6. Canbolat, H., Burg, T., Dawson, D.M., and Nagarkatti, S., "A Near Output Feedback Controller for a General Class of Robot Manipulator Systems", *International Journal of System Science*, **30(5)**, 515-525 (1999).
7. Burg, T., and Dawson, D., "Additional Notes on the TORA Problem: A Filtering Approach", *IEEE Transactions on Control System Technology*, **5(5)**, pp. 520-523 (1997).
8. Vedagarbha, P., Dawson, D., and Burg, T., "Rotor Velocity Flux Control of Induction Motors with Improved Efficiency", *Mechatronics*, **7(2)**, 105-127 (1997).
9. de Queiroz, M.S., Donepudi, S., Burg, T., and Dawson, D.M., "Model-Based Control of Rigid-Link Flexible-Joint Robots: An Experimental Evaluation", *Robotica*, **16(1)**, 11-21 (1998).
10. Burg, T., Dawson, D., and Vedagarbha, P., "A Redesigned DCAL Controller without Velocity Measurements: Theory and Demonstration", *Robotica*, **1(5)**, 337-346 (1997).
11. de Queiroz, M.S., Dawson, D., and Burg, T., "Position/Force Control of Robot Manipulators without Velocity/Force Measurements", *International Journal Robotics and Automation*, **12(1)**, 1-14 (1997).
12. de Queiroz, M., Hu, J., Dawson, D., Burg, T., and Donepudi, S., "Adaptive Position/Force Control of Robot Manipulators without Velocity Measurements: Theory and Experimentation", *IEEE Transactions on Systems, Man, and Cybernetics*, **27-B(5)**, 796-805 (1997).
13. Burg, T., Dawson, D., Hu, J., and de Queiroz, M., "An Adaptive Partial State Feedback Controller for RLED Robot Manipulators", *IEEE Transactions on Automatic Control*, **41(7)**, 1024-1030 (1996).

14. Vedagarbha, P., Burg, T., Hu, J., and Dawson, D., “Development and Demonstration of a New Class of Adaptive Partial State Feedback Controllers for Electric Motors”, *Mechatronics*, **6(6)**, 691-727 (1996).
15. Burg, T., Dawson, D., and Vedagarbha, P., “Sensorless Velocity Control for a Series Connected Wound Stator DC Motor”, *Mechatronics*, **5(4)**, 349-364 (1995).
16. de Queiroz, M., Dawson, D., and Burg, T., “Reexamination of the DCAL Controller for Rigid Link Robots”, *Robotica*, **14**, 41-49 (1996).

Conference Proceedings (Reviewed)

1. Lee, D., Nataraj, C., Burg, T., Ramesh, T., “Robust and Adaptive Tracking Control of a Surface Vessel”, 2010 American Control Conference, (submitted September 2009).
2. Xu, P., Groff, R., Burg, T., “The Rigid Body Dynamics of Shoot-the-moon Game and Model-based Controller Design”, 2010 American Control Conference, (submitted September 2009).
3. Nath, N., Burg, T., Dawson, D., Iyasere, E., “Optimizing Antiangiogenic Therapy for Tumor Minimization”, 2010 American Control Conference, (submitted September 2009).
4. Kapadia, A., Nath, N., Burg, T., Dawson, D., “Lyapunov-Based Continuous-Stirred Tank Bioreactor Control to Maximize Biomass Production Using the Haldane and Monod Specific Growth Models”, 2010 American Control Conference, (submitted September 2009).
5. Lee, D., Burg, T., Dawson, D., Shu, D., Xian, B., Tatlicioglu, E., “Robust Tracking Control of an Underactuated Quadrotor Aerial-Robot Based on a Parametric Uncertain Model”, *Proceedings of the 2009 IEEE International Conference on Systems, Man, and Cybernetics*, (to appear October 2009).
6. Pepper, M.E., Parzel, C.A., Burg, T., Boland, T., Burg, K.J., and Groff, R.E., "Design and Implementation of a Two-Dimensional Inkjet Bioprinter", *Proceedings of the 31th International Conference of the IEEE Engineering in Medicine and Biology Society (IEEE EMBC)*, pp. 6001-6005, Minneapolis, MN, (September, 2009).
7. Singapogu, J., Burg, T., “Haptic Virtual Manipulatives for Enhancing K-12 Special Education”, *ACM-SE 47: Proceedings of the 47th Annual Southeast Regional Conference*, Clemson, SC, (March 2009). {DOI: 10.1145/1566445.1566547}
8. Singapogu, R., Pagano, C., Burg, T., “Perceiving the Lengths of Real and Virtual Objects using Kinesthetic Touch”, *ACM-SE 47: Proceedings of the 47th Annual Southeast Regional Conference*, Clemson, SC, (March 2009). {DOI: 10.1145/1566445.1566548}
9. Lee, D., Tatlicioglu, E., Burg, T., Dawson, D., “Adaptive Output Tracking Control of a Surface Vessel”, *Proceedings of the 47th IEEE Conference on Decision and Control*, pp 1352 – 1357, Cancun, Mexico, (December, 2008). {DOI: 10.1109/CDC.2008.4739313}
10. Parzel CA, Pepper, ME, Groff, RE, Burg T, Burg, KJL. “EDTA as an Anti-scalant and anti-aggregant in bioprinting applications”. *Transactions of the 33rd Annual Meeting of the Society for Biomaterials*, Poster Presentation, Vol. 31, (September, 2008).
11. Singapogu, R., Sander, S., Burg, T., Cobb, W., "Comparative Study of Haptic Training versus Visual Training for Kinesthetic Navigation Tasks” study chapter in *Medicine Meets Virtual Reality 16: parallel, combinatorial, convergent: NextMed* by

- Design - Volume 132 Studies in Health Technology and Informatics*, edited by James Westwood, pp 469-471, IOS Press Inc, Amsterdam, The Netherlands, ISBN: 978-1-58603-822-9, (January 2008).
12. Singapogu, R., Sander, S., Burg, T., Cobb, W., "A Five DOF Haptic Rendering Algorithm using Multiple Contact Points" *Proceedings of SoutheastCon 2008*, Huntsville, Alabama, pp. 262 - 267, (April, 2008).
 13. Tatlicioglu, E., Braganza, D., Burg, T., Dawson, D., "Adaptive Control of Redundant Robot Manipulators With Sub-task Objectives", *Proceedings of 2008 American Control Conference*, Seattle, WA, pp. 1775-1780, (July, 2008).
 14. Lee, D., Tatlicioglu, E., Burg, T., Dawson, D., "Robust Output Tracking Control of a Surface Vessel", *Proceedings of 2008 American Control Conference*, Seattle, WA, pp. 544-549, (July, 2008).
 15. Lee, D., Chitrakaran, V., Burg, T., Dawson, D., Xian, B., "Control of a Remotely Operated Quadrotor Aerial Vehicle and Camera Unit Using a Fly-The-Camera Perspective", *Proceedings of the 46th IEEE Conference on Decision and Control*, New Orleans, LA, pp. 6412 – 6417, (December, 2007).
 16. Boland, T., Cui, X., Chaubey, A., Burg, T., Groff, R., Burg, K., "Precision Printing Of Cells And Biomaterials Onto 3D Matrices", *Proceedings of the ASME International Manufacturing Science and Engineering Conference 2007*, American Society of Mechanical Engineers, 2007, pp. 77-82, Atlanta, Georgia (October 2007).
 17. Boland, T., Burg, T., Groff, R., "Engineering Challenges in Biofabrication", *23rd International Conference on Digital Printing Technologies and Digital Fabrication 2007*, Anchorage, Alaska, September 2007; p. 7-9; ISBN / ISSN: 0-89208-273-9, (September, 2007).
 18. Chaubey, A., Boland, T., Burg, T., Burg, K., "Cell Matrices on 3-D Matrices Using a Modified Inkjet Printer", *Transactions of the 32nd Annual Meeting of the Society for Biomaterials*, Chicago, IL, (Sept, 2007).
 19. Burg, T., Groff, R., Burg, K., and Boland, T., "Systems Engineering Challenges in Biofabrication" , *Proc. of the IEEE SoutheastCon*, Richmond, Virginia, pp. 395-398, March 2007.
 20. Neff, A., Lee, D., Chitrakaran, V., Dawson, D., and Burg, T., "Velocity Control for a Quad-Rotor UAV Fly-By-Camera Interface", *Proc. of the IEEE SoutheastCon*, Richmond, Virginia, pp. 273-278, March 2007.
 21. Tatlicioglu, E., Xian, B., Dawson, D. and Burg, T., "Adaptive Control of Flat MIMO Nonlinear Systems With Additive Disturbance", *Proceedings of 2007 American Control Conference*, New York, NY, pp. 1197-1202, (July, 2007).
 22. Lee, D., Burg, T., Xian, B., and Dawson, D., "Output Feedback Tracking Control of an Underactuated Quad-Rotor UAV", *Proceedings of 2007 American Control Conference*, New York, NY, pp. 1775-1780, (July, 2007).
 23. Kannan, H., Chitrakaran, V., Dawson, D. and Burg, T. "Vision-Based Leader/Follower Tracking for Nonholonomic Mobile Robots", *Proceedings of 2007 American Control Conference*, New York, NY, pp. 2159-2164, (July, 2007).
 24. Tatlicioglu, E. McIntyre, M., Dawson, M., and Burg, T., "Coordination Control for Haptic and Teleoperator Systems," *Proceedings of the 45th IEEE Conference on Decision & Control*, San Diego, CA, pp. 2937-2942 (December, 2006). [Awarded Best Paper in Session ThA17.2]

25. Chen, J., Dawson, D., Salah, M., and Burg, T., "Multiple UAV Navigation with Finite Sensing Zone", *Proceedings of the American Controls Conference*, Minneapolis Minnesota, pp. 4933-4938, (June 2006).
26. McIntyre, M., Burg, T., Dawson, D., Xian, B., "Adaptive State of Charge (SOC) Estimator for a Battery" *Proceedings of the American Controls Conference*, Minneapolis Minnesota, pp. 5740-5744, (June 2006).
27. Burg, K.J.L., Mikos, A.G., MBeiler, R.J., Culberson, C.R., Greene, K.G., Loeb sack, A.B., Roland, W.D., Wyatt, S., Halberstadt, C.R., Holder, Jr, W.D., and Burg, T.C., "Particulate Selection and Importance to Cell Adhesion in Solvent-Cast, Particulate-Leached Polymeric Constructs", *Transactions of the 25th Annual Meeting of the Society for Biomaterials*, Providence, RI, (April 1999).
28. Burg, T., Dawson, D., and Vedagarbha, P. , "Expanding the Role for Nonlinear Control Design in Oxide Growth Using Rapid Isothermal Processing", *Proceedings of the 4th IEEE Conference on Control Applications*, pp. 840-845, Dearborn, MI (September 1996).
29. Vedagarbha, P., Dawson, D.M., and Burg, T., "Adaptive Control for a Class of Induction Motors via an On-Line Flux Calculation Method", *Proceedings of the 4th IEEE Conference on Control Applications*, pp. 620-625, Dearborn, MI (September 1996).
30. de Queiroz, M., Donepudi, S., Burg, T., and Dawson, D., "Experimental Evaluation of Link Position Tracking Controllers for Rigid-Link Flexible-Joint Robots", *Proceedings of the 1996 IEEE Conference on Decision and Control*, pp. 4092-4097, Kobe, Japan (December 1996).
31. Vedagarbha, P., Dawson, D., Rhodes, W., and Burg, T., "Nonlinear Control of Induction Motors: The Observed Field Oriented Control Scheme", *Proceedings of the 35th IEEE Conference on Decision and Control*, pp. 4707-4712, Kobe, Japan (December 1996).
32. Burg, T., Dawson, D., Rahn, C., and Rhodes, W., "Nonlinear Control of an Overhead Crane via the Saturating Control of Teel", *Proceedings of the 1996 IEEE International Conference on Robotics and Automation*, pp. 3155-3160, Minneapolis, MN (April 1996).
33. de Queiroz, M., Dawson, D., and Burg, T., "Position/Force Control of Robot Manipulators without Velocity/Force Measurements" , *Proceedings of the 1996 IEEE International Conference on Robotics and Automation*, Vol. 3, pp. 2561-2566, Minneapolis, MN (April 1996).
34. Zhu, Y., Dawson, D., Burg, T., and Hu, J., "A Cheap Output Feedback Controller with Robustness: The RLFJ Problem", *Proceedings of the 1996 IEEE International Conference on Robotics and Automation*, pp. 939-944, Minneapolis, MN, (April 1996).
35. Vedagarbha, P. , Dawson, D. M., and Burg, T., "Velocity Tracking/Setpoint Control of Induction Motors with Improved Efficiency", *Proceedings of the International Federation on Automatic Control*, pp. 37-42, San Francisco, CA (July 1996).
36. Vedagarbha, P., Dawson, D. M. and Burg, T. "An Adaptive Control for a General Class of Switched Reluctance Motor Models", *Proceedings of the International Federation on Automatic Control*, pp. 471-476, San Francisco, CA, Jul. 1996.
37. Lim, S. Y., Burg, T., Dawson, D., and Blair, C., "Dexterity Module for a Semi-Autonomous Mobile Waste Barrel Inspection System", *Proceedings of the 26th*

- International Symposium on Industrial Robots*, pp. 449-454, Singapore (October 1995).
38. Vedagarbha, P., Burg, T., and Dawson, D., and Hu, J., "A Systematic Procedure for the Design of Adaptive Partial State Feedback Controllers for Electric Machines", *Proceedings of the 34th IEEE Conference on Decision and Control*, Vol. 3, pp. 2133-2138, New Orleans, LA (December 1995).
 39. Zhu, J., Dawson, D., Burg, T., and Hu, J., "Robust Output Feedback Link Position Tracking Controller for BDC RLED Robots", *Proceedings of the 4th IEEE Conference on Control Applications*, pp. 904-909, Albany, NY (September 1995).
 40. de Queiroz, M., Burg, T., Dawson, D., and Donepudi, S., "A Partial State Feedback Controller for SRM-RLED Robot Manipulators: Preliminary Experimental Validation", *Proceedings of the 4th IEEE Conference on Control Applications*, pp. 916-921, Albany, NY (September 1995).
 41. Burg, T., Dawson, D., Hu, J., and Lim, S., "An Adaptive Partial State Feedback Controller for RLED Robot Manipulators Actuated by BLDC Motors", *Proceedings of the 1995 IEEE International Conference on Robotics and Automation*, Vol. 1, pp. 300-305, Nagoya, Aichi, Japan (May 1995).
 42. Hu, J., de Queiroz, M., Burg, T., and Dawson, D., "Adaptive Position/Force Control of Robot Manipulators without Velocity Measurements", *Proceedings of the 1995 IEEE International Conference on Robotics and Automation*, Vol. 1, pp. 887-892, Nagoya, Aichi, Japan (May 1995).
 43. Vedagarbha, P., Dawson, D., Burg, T., and Hu, J., "Development and Demonstration of a New Class of Adaptive Partial State Feedback Controllers for Electric Motors", *Proceedings of the 1995 American Control Conference*, Vol. 1, pp. 59-63, Seattle, WA (June 1995).
 44. Burg, T., Hu, J., and Dawson, D., "A Redesigned DCAL Controller without Velocity Measurements: Theory and Experimentation", *Proceedings of the 33rd IEEE Conference on Decision and Control*, pp. 824-828, Lake Buena Vista, FL (December 1994).
 45. Hu, J., Dawson, D., Burg, T., and Vedagarbha, P., "An Adaptive Tracking Controller for a Brushless DC Motor with Reduced Overparameterization Effects", *Proceedings of the 33rd IEEE Conference on Decision and Control*, Vol. 1, pp. 1850-1855, Lake Buena Vista, FL (December 1994).
 46. Hu, J., Burg, T., and Dawson, D., "An Output Feedback Controller for a RLED Robot Actuated by Brushless DC Motors", *Proceedings of the 1994 ASME Winter Annual Meeting*, DSC-Vol. 55-1, pp. 181-192, Chicago, IL (November 1994).
 47. Hu, J., Burg, T., and Dawson, D., "Nonlinear Tracking Control of Brushless DC Motors", *Proceedings of the 1994 IEEE Industrial Applications Society Annual Meeting*, Vol. 1, pp. 480-487, Denver, CO (October 1994).
 48. Burg, T., Dawson, D., Hu, J., and Vedagarbha, P., "A Global Exponential Position Tracking Controller for a Permanent Magnet Stepper Motor via Output Feedback", *Proceedings of the 3rd Conference on Control Applications*, Vol. 1, pp. 213-218, Glasgow, Scotland (August 1994).
 49. Burg, T., Dawson, D., Hu, J., and de Queiroz, M., "An Adaptive Partial State Feedback Controller for RLED Robot Manipulators", *Proceedings of the 3rd Conference on Control Applications*, Vol. 1, pp. 709-714, Glasgow, Scotland (August 1994).

50. Burg, T. and Dawson, D., "Velocity Tracking Control of a Separately Excited DC Motor Without Velocity Measurements", *Proceedings of the 1994 American Control Conference*, Vol. 1, pp. 1051-1056, Baltimore, MD (June 1994).
51. Burg, T., Gao, X., and Dawson, D., "Robust Control for the Improvement of Loudspeaker Low-Frequency Response", *Proceedings of Southeastcon '93*, Charlotte, NC (April 1993).

Conference Proceedings (Abstract Reviewed)

1. C Parzel, T Burg, R Groff, M Pepper, T Boland, KJL Burg, "Observations on Inkjet Cartridge Parameters for Biomaterial Deposition", *Transactions of the 2009 Annual Meeting and Exposition of the Society for Biomaterials*, San Antonio, TX, (April, 2009).
2. Parzel, C.A., Pepper, M.E., T Burg, RE Groff, KJL Burg, "High Resolution Cell Patterning and Co-Culture Using a Custom BioPrinter", *Transactions of the 2009 Annual Meeting and Exposition of the Society for Biomaterials*, San Antonio, TX, (April, 2009).

PRESENTATIONS

Technical Presentations (not listed as conference publications)

1. "Biofabrication" at the Emerging Frontiers in Research and Innovation (EFRI) PI's Meeting in Monterey, CA, August, 2009.
2. R. Singapogu, C. Pagano and T. Burg, "Perceiving the Lengths of Virtual Objects Using Kinesthetic Touch", Poster, The Fifteenth International Conference on Perception and Action, Minneapolis, MN, July, 2009.
3. T. Burg for AJ Sweeney, KJL Burg, Z Gao, "Development of a Single-Cell Neurotoxicity Assay" at the 2009 Society for Biomaterials Conference, San Antonio, TX, April 2009.
4. T. Burg, A. Mount, and A. Feltus, Poster "Mirrored Environments for Study of Genetic Stress Markers in Marine Wildlife", South Carolina Computing Consortium exhibit booth at SC08 conference, (international conference for high performance computing (HPC), networking, storage and analysis), Austin TX, (November, 2008).
5. Feltus, A. Mount, and T. Burg, "Mirrored Environment for Oyster Monitoring", South Carolina Marine Genomics Consortium (March 2008).
6. Parzel, C., Groff, R., Hill, A., Stripe, B., Burg, T., Burg, K., "The Modified Inkjet Cell Printer as a Tool for 3-Dimensional Breast Tissue Modeling", Symposia (P1-10) and Poster Presentations at The Department of Defense Breast Cancer Research Program Meeting, Baltimore, MD (June 2008)
7. Singapogu, R., Sander, S., Burg, T., Cobb, W., "Comparative Study of Haptic Training versus Visual Training for Kinesthetic Navigation Tasks", *Medicine Meets Virtual Reality 16*, Long Beach, CA (January 2008).
8. Burg, T., "Burg Research Program Overview", ECE External Advisory Board Meeting, Clemson, SC, (September 2005).
9. Burg, T., Burg, K., Dooley, L., "What is Research?", Math Excellence Workshop (MEW) Symposium, Clemson University, Clemson, SC (August 2005).
10. Burg, T, "Coming To The Realization That Getting The Chip Cost Down Is A Cross-Industry Effort", Logicon 2005, Ritz Carlton Huntington Hotel & Spa, Pasadena CA, (June 2005).

11. Burg, T , "Use of RFID for Tire Tracking", *2005 USAF Supply Chain Automatic Identification Technology Forum*, St. Louis, MO, (March 2005).
12. Burg, T , "The Mentor-Protégé Relationship – A Protégé Perspective", *Clemson Research Forum*, Clemson, SC, (April 2003).
13. Burg, K., Jenkins, L., and Burg, T., "Tissue Engineering and the Histology Lab", *Workshop at the 2003 NSH Symposium/Convention*, Louisville, KY, (September 2003).
14. Burg, K., Jenkins, L., and Burg, T., "Tissue Engineering and the Histology Lab" *Workshop at the 2002 NSH Symposium/Convention*, Long Beach, CA, (September 2002).

Workshops

1. Burg, K. and Burg, T., *Workshop - "To Publish or Not to Publish"*, Society of Histotechnology National Meeting, Phoenix, AZ, 1:30pm – 5:00pm, September 11, 2006, (4hrs).
2. Panelist at *Workshop "Everything You Wanted to Know About Reviewing Journal Articles, but Were Afraid to Ask"* (Organizer: Joel Bumgardner, PhD University of Memphis) at the 2009 Annual Meeting and Exposition of the Society for Biomaterials, San Antonio, TX, April 2009.
3. Burg, T , "Master-Class B: In the Factory Issues For Implementing UHF RFID", *RFID for Defense Conference*, Arlington, VA, Hilton Arlington and Towers, (February 2005).
4. "Industry or Academia - Plan Your Path", *Professional Development Workshop for Students (~100 Attendees)*, Annual Meeting of the Society for Biomaterials, Pittsburgh, PA , April 26, 2006.
5. Burg, K. and Burg, T., *Workshop - "To Publish or Not to Publish"*, Society of Histotechnology Region III Meeting, Charleston, SC, (8am – 11:30am, March 11, 2006).

Other Media

- Commission on Higher Education used photo of antenna measurement system for the Centers of Economic Excellence annual report. Sandra Woodward Public Information Director/ Research & Economic Development, May, 2009.

INTELLECTUAL PROPERTY

- R. Singapogu and T. Burg, Patent disclosure "Manipulatives for instruction with touch feedback", submitted September 2008.
- T Boland, K. Burg, T. Burg, Patent disclosure "Meta-fabricator", submitted May, 2006.

HONORS AND AWARDS

Personal

- IEEE Senior Member, June27 2009 Meeting
- "Bioprinting" nominated for *The Scientist* "Top 10 Life Science Innovations of the Year", submitted September 15, 2009, selection during December 2009.
- Best Paper in Session, IEEE Conference on Decision and Control, (December, 2006).

Students

Matthew Pepper (PhD student, paper author) received National Institute of Biomedical Imaging and Bioengineering (NIBIB)/National Institutes of Health (NIH) Student Travel Fellowship to the Engineering Medicine and Biology Conference 2009.

SPONSORED RESEARCH

In Preparation

1. "Haptic Virtual Manipulatives", T. Burg and P. Ricomini, Fullerton Foundation, Gaffney, SC, PI, \$91,000 (181,961), (submitted March, 2009, expected April 2009).
2. "Haptic Virtual Manipulatives", T. Burg, 2-page concept paper submitted to The Sloan Foundation (via Sherry Beasley, Foundations, Coordinator Office of the Provost), no budget provided, (Submitted March 16, 2009, expected April, 2009).

Current

1. "MRI: Development of a Laser Microbioparticle Separator", Z Gao, Y. Wei, T. Burg, H. Yao, National Science Foundation, Co-Investigator, \$496,070 (\$49,607), (9/2009 - 8/2012).
2. "EFRI-CBE: Emerging Frontiers in 3-D Breast Cancer Tissue Test Systems", National Science Foundation, Co-Investigator, \$1,700,000 (\$300,000), (11/2007 - 10/2011).
3. "Applied Instrumentation and Control", Creative Inquiry, \$2500 for Spring, 2009 and \$1,500 for Fall 2009, \$4000(\$4000).

Pending

1. "CAREER: An Integrated Research, Teaching, and Outreach Program Addressing Optimization of Anti-Angiogenic Therapy To Prevent Breast Cancer Tumor Progression", Faculty Early Career Development (CAREER) Program (NSF 08-557), Proposal No: **, National Science Foundation, \$405,000 (\$405,000), submitted July 23, 2009, decision expected February, 2010.
2. "IGERT: A Collaborative Approach to Design, Validation, and Application of Tissue Test System", National Science Foundation, Co-Investigator, \$3,199,765 (127,990), 05/01/2010-04/30/2015, (submitted September, 2009).
3. "Renovation of Institute for Biological Interfaces of Engineering Core Facilities to Enhance Translation and Collaboration", National Institutes of Health, Co-Investigator, \$5,151,347 (\$206,053), 07/01/2010-06/30/2015, (submitted 9/2009).

Completed

1. "BBSI in Biomaterials Science and Engineering at Clemson", National Science Foundation, Co-Investigator, total award \$450,000 (\$45,000), (9/01/2006 to 8/31/2009), annual renewal award \$150,000 (\$15,000), (8/15/2006 - 7/31/2007).
2. "Mirrored Micro-Environments to Determine the Genetic Impact of Environmental Change on Marine Wildlife" Creative Inquiry, \$2500 for Spring, 2008 and \$2,500 for Fall 2008, \$5000(\$2000).
4. Michelin Donation of RFID equipment, antennas, software. estimated value \$5,000 (\$5000), (8/2008).
3. "Study of RF Measurement Tools for Vehicular Systems", Michelin Americas Research and Development Corporation, Principal Investigator, \$62,000 (\$62,000), (9/05-8/06).

STUDENT ADVISING

Current Student Advising

Major Research Advisor

1. Ravi (Joseph) Singapogu, PhD BioE, “Haptics for Laparoscopic Surgery Training”, (est 8/2010)
2. Ninad Pradhan, PhD ECE, “Vision as A Sensor”, (est 12/2010)
3. Peng Xu, PhD ECE, “UAV Control”, (est 2012)
4. Dule Shu, MS ECE, “UAV Control” (est 12/09)
5. Varun V Prabhu, MS ECE, “Haptics Applications”, (est 2011)

Graduate Advising Committee

1. Justin Mattimore, MS ECE, “Biofabrication”, (est 8/2010)
2. Matthew Pepper, PhD ECE, “Biofabrication”, (est 8/2011)
3. Nathan Brown, PhD BioE, “Biofabrication” (est 8/2012)
4. Cheryl Parzel, PhD BioE, (est 12/2009)
5. Brittany Lampson, PhD Biosciences, (est 9/2012)
6. Nitendra Nath, PhD ECE, (est 2010)
7. Erin McCave, PhD BioE, (est 7/2012)

Undergraduate Students

1. Marykate Manhard, Honors Project, “Vision processing for Bioprinting System Evaluation”, Fall 2009.
2. Chris Briere, Honors Project, “Robotic Bead Deposition System for Biofagrication”, Fall 2009.
3. General Undergraduate Student Advising – Spring 2009 14 students

Graduates

Major Research Advisor

1. Dongbin Lee, PhD, “Lyapunov-based Coordinated Control of an Underactuated Unmanned Aerial Vehicle and Robot Manipulator”, graduated 8/2009.
2. Abhishek Bhargava, MS, “Linear Position Control of a Quadrotor UAV”, graduated 12/2008.
3. Ron Zacharia, MS, non-thesis report “Applications of Digital Signal Processing in Haptic Technology”, graduated 5/1/2009.
4. Martin Hill, MS, “A Systems Approach To The Design Of A Two Dimensional Cell Printer”, graduated 5/2008.
5. Rohit Samdani, MS, non-thesis project “Reverse Engineering the Motion Trajectory Generator on the Rotomotion SR20 Helicopter”, graduated 5/2008.
6. Ravi (Joseph) Singapogu, MS, “Comparative Study Of Haptic And Visual Feedback For Kinesthetic Training Tasks”, graduated 5/2007.
7. Andy Neff (MS), “Linear And Non-Linear Control Of A Quadrotor UAV”, graduated 5/2007.

Other

1. Hosted Professor Paul Guenther Dorn, Fulbright Scholar, Professor for Automation in the Department of Electrical Engineering at University of Applied Sciences (Fachhochschule) Landshut, Germany, 2/2008-8/2008.
2. Tim Budinger exchange student from Fachhochschule Trier, University of Applied Sciences, Germany research paper “The Application of a Video Height Estimation System for Augmentation of the GPS-Based Flight Controller in the SR20 Unmanned Aerial Vehicle” for Dipl. Elektrotechnik Ingenieur (FH), 5/2007-8/2007.
3. Co-Hosted Research Experience for Teachers (RET) Brenda Hunterford participant during Summer 2007.
4. Co-advisor to IEEE robotics team, 2006-2007.

Graduate Advising Committee

1. Justin Ingersoll, MS Committee Member, Graduated 5/2008
2. David Braganza, PhD Committee Member, 7/2007
3. Enver Tatlicioglu, PhD Committee Member, graduated 12/2007
4. Mohamed Salah, PhD Committee Member, 7/2007
5. Nitendra Nath, MS Committee Member, 2006
6. Ninad Pradhan, MS Committee Member, 2006

Undergraduate Students

- Co-Leader “Mirrored Environments” Creative Inquiry Team, University funding award for academic year 2007-2008, \$5000, Spring 2008 twenty students participated.
- BBSI Student Whitney Flour, Summer 2007.
- Leader “Unmanned Aerial Vehicle Research” Creative Inquiry Team, University funding award for academic year 2007-2008, \$5000, Spring 2007 seven students started team, Fall 2008 four students
- Michael Lemus, “Haptic Interface for Laparoscopic Surgery Training”, SCAMP Program (1/06-8/06), Bioengineering and Bioinformatics Summer Institute” (6/06-8/06), Louis Stokes South Carolina Alliance for Minority Participation (LS-SCAMP) (1/06-8/06).
- Patrick Bartlow, “Development of a Downstream Automation System for Use with a Bench-top Polymer Extruder”, (1/06-5/06).
- James Sprowl, Electrical Engineering, “Winding Mechanism for 3DG Fibers”, (Spring 2005).

TEACHING

Courses Taught

ECE 307 Basic Electrical Engineering

ECE801 Linear Systems

ECE 495, Senior Design, F05, S06, F06. Obtained \$35,000 from the College of Engineering and Science to create a hardware component in the design class. Hardware implemented Fall 2006. Passed ABET.

ECE 874 (co-taught Spring 2009)

UNIVERSITY AND PUBLIC SERVICE

University Service

- Clemson University Academic Advising Committee (Fall 2007 – Spring 2009)
- Robotic Surgery demonstration table at the the Major Donors Event, Clemson, SC (7pm – 10pm, Sept 23, 2005).
- Helper at Move-In day, Clemson, University, (August, 2005)
- Clemson Summer Reading Program for incoming freshmen: Discussion Leader Fall 2007, Discussion Leader Fall 2008, Discussion Leader Fall 2009.

College Service

- Clemson Women in Science and Engineering (WISE) Program
 - “The Wii Experience”, WISE Girl Scout Workshop, 4hour, 90 girls, Feb, 2009.
 - “Solar Spiders Robotic Spider”, WISE Workshop - Taught Electrical Engineering class for rising 8th grade girls in the WISE one week summer workshop. In class effort was 4.5 hours/day for 4 days. June 24-June28, 2007; June 23-June 27, 2008, June 29-July 2, 2009.
 - “Careers in Electrical Engineering” at the "WISE Experience", Clemson University, 30 minutes, July 18, 2007.
 - “Engineering Interactive Games”, WISE PAW Experience, 6hrs, 74 high-school students, April 17, 2009.
- PEER Office (support program for minority students in the College of Engineering and Science)
 - Judge of oral presentations at the Louis Stokes South Carolina Alliance for Minority Participation (LS-SCAMP) Annual Science and Engineering Research Conference summer research symposium, Orangeburg, SC July 26, 2008, (12 hrs).
 - Judge of oral presentations at the Louis Stokes South Carolina Alliance for Minority Participation (LS-SCAMP) Annual Science and Engineering Research Conference summer research symposium, Orangeburg, SC July 29, 2006, (12 hrs).
- Judge at FIRST robotics competition, Clemson University, 16 hours, March 26, 2009.
- Exhibitor at the Advanced Materials Expo at the Zoom Zone Showcase in Anderson, SC, Clemson University Research Foundation (Oct 14, 2005, 4hr).
- Engineering and Science Expo, Clemson University, February 26, 2007. Undergraduate students and I demonstrated Unmanned Aerial Vehicles to 8th graders.

Department Service

Undergraduate Recruitment

- “Computer Engineering, Electrical Engineering, and Computer Science – Differences and Similarities” talk to Freshman Engineering Class, 100 students, 1 hour, Spring, 2009.
- “Careers in Electrical and Computer Engineering” presentation to freshman engineering class, 30 minutes, ~100 attendees, 9/10/2008.

- Freshman Electrical Engineering Tours. Presentations to freshman engineering students exploring Electrical Engineering as a major. Clemson, SC. (15 presentations Fall 2007, developed new video and demo) (4 presentations Fall 2008).
- Career video for CES 102. Interviewed about "what does an electrical engineer do?". August 25, 2009.
- Careers day at Greenville High School, Greenville, SC, (11am-2pm, March 10, 2006).
- Freshman Electrical Engineering Tours. Presentations to freshman engineering students exploring Electrical Engineering as a major. Clemson, SC. (Six presentations 6pm – 9pm, Nov 17, 2005, Six presentations 6pm – 9pm, Oct 25, 2006).
- Participant in 2006 CES Faculty Telephone Recruiting Campaign (March, 2006).
- “Discover Clemson” Two presentations to rising high school seniors about ECE, ~300 people total, 9:00am-1:00pm Saturday May 17, 2008.
- “Computer Engineering, Electrical Engineering, and Computer Science – Differences and Similarities” talk to Freshman Engineering Class, Spring, 2008.

Department Committees

- Graduate Program Committee (Fall 2009 - pres)
- Bioelectronics Faculty Search Committee (Fall 2007)
- Intelligent Systems Course Committee (Fall 2005 - present).
- Undergraduate Program Committee (Fall 2006 – Fall 2009)

Presentations and Meetings in Support of the Department

- Presentation “Overview of Intelligent Systems” to SPAWAR representative Jeff Henson and SCRA representative Charles Watt.
- “Senior Design in Electrical Engineering at Clemson” presentation to Raytheon College Relations Director Victor Rivera, 1 hour, Spring 2009.
- Lab tours of UAV lab. June 22, 2009
- Presentation to CISCO Systems (Andy Campbell, Doug Cohmer) to highlight ECE Department activities in human-centered computing for the CISCO Systems University Research Program (URP) (Jan 2008).
- Presentation to Hewlett-Packard to highlight ECE Department activities in bioprinting (Dec 2007).
- Department representative to the ICAR Automotive Engineering Curriculum Review Meeting, ICAR (Sept 29, 2005, 8hr).

Public Service

- Development of a kiosk to teach users about bioengineering applications and research. Short-term target is Clemson Alumni Center and long-term target is a module for the Boston Museum of Science. Initial demonstration May 2006, project ongoing.
- Mentor on the EnTech FIRST Robotics Competition Team,. Co-lead team of high school students to build robots to compete in the FIRST Robotics competition.

Regional champions 2004 and 12th at national competition. Greenville, SC, (2001 - 2005).

MISCELLANEOUS

Personal Development - Teaching

- "Teaching And Managing Large Classes", Clemson University, (2 hr, 9/12/2008).
- "Concept Maps, Mind Maps, and Concept Circle Diagrams", Clemson University, (2 hr, 2/15/2008).
- "The ePortfolio Puzzle: A Fresh Perspective", Clemson University, (2 hr, 10/30/2007).
- "The Pedagogy Of Blended Learning: Complementing The Classroom", Clemson University, (1.5 hr, 8/9/2007).
- "Discussion: Creative Inquiry Challenges and Solutions", Clemson University, (2 hr, 6/13/2007).
- "'SCALEUP' approach to teaching engineering and science courses", Clemson University, (1.5 hr, 2/2/2007).
- "Ethics Across the Curriculum", Clemson University, (16 hr, 8/14/2006 - 8/16/2006).
- "Engaging Students in Your Lecture", Clemson University, (2 hr, 3/16/2006).
- "Workshop: Fast but Fair Methods to Grade Writing", Clemson University, (2 hr, 2/10/2006).
- "Workshop: Writing a Teaching Philosophy", Office of Teaching Effectiveness and Innovation, Clemson University, (8/15/2005).
- "Workshop: How to Get Your Students to Do the Readings", Office of Teaching Effectiveness and Innovation, Clemson University, (7/19/2005).
- "Workshop: Teaching Your Students How to Read Academic Material", Office of Teaching Effectiveness and Innovation, Clemson University, (7/19/2005).
- "Pedagogically Sound Ideas for Using Laptops and the Web in Class", Office of Teaching Effectiveness and Innovation, Clemson University, (7/19/2005).

Personal Development - Research

- "Workshop: How to Become a Successful Author of Scientific Articles", Clemson University, Office of Teaching Effectiveness and Innovation, (2 hr, 1/13/2006).
- "2005 Grant Writer's Workshop", Clemson University, (8 hr, 10/25/2005).