

**CURRICULUM VITAE**  
George Stetten, M.D., Ph.D.

**BIOGRAPHICAL**

<b>Home Address:</b>	105 Nantucket Drive Pittsburgh, PA 15238	<b>Birth Date:</b>	15-DEC-1953
		<b>Citizenship:</b>	USA
<b>Business Address:</b>	749 Benedum Hall University of Pittsburgh 3700 O'Hara Street Pittsburgh, PA 15261	<b>Phone:</b>	(412) 624-7762
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**EDUCATION AND TRAINING**

<b>Dates Attended</b>	<b>Name and Location of Institution</b>	<b>Degree Received and Year</b>	<b>Major Advisor and Discipline</b>
1971-1976	Harvard University	<b>A.B.</b> 1976	Engineering and Applied Physics
1985-1986	New York University Dept. Biology/Courant Institute	<b>M.S.</b> 1986	Neuroscience Computer Graphics/Vision
1986-1990	State University of New York Health Science Center at Syracuse	<b>M.D.</b> 1991	Medicine
1991-1992	Department of Radiology Duke University Medical Center		Clinical Resident, Scholar's Program
1996-1999	University of North Carolina Chapel Hill (while on the faculty at Duke University)	<b>Ph.D.</b> 2000	Biomedical Engineering Stephen Pizer (advisor)

**APPOINTMENTS and POSITIONS**

**ACADEMIC:**

<b>Years Inclusive</b>	<b>Name and Location of Institution or Organization</b>	<b>Rank/Title</b>
2004-present	Department of Bioengineering University of Pittsburgh	Associate Professor with tenure
1999-present	Visualization and Image Analysis Laboratory ( <a href="http://www.vialab.org">www.vialab.org</a> )	Director

George DeWitt Stetten, MD, PhD

2005-present	Robotics Institute Carnegie Mellon University	Associate Research Professor
2003-present	Department of Biomedical Engineering Carnegie Mellon University	Associate Research Professor (Courtesy)
2005-present	Department of Radiology University of Pittsburgh	Associate Professor (Secondary)
2003-present	University of Pittsburgh School of Engineering	Bicentennial Alumni Faculty Fellow
2003-2005	Department of Radiology University of Pittsburgh	Assistant Professor (Courtesy)
1999-2005	Robotics Institute Carnegie Mellon University	Research Scientist
1999-2004	Department of Bioengineering University of Pittsburgh	Assistant Professor,
1992-1999	Department of Biomedical Engineering Duke University	Assist. Research Professor
1985-1986	Department of Biology New York University	Adjunct Instructor

**NON-ACADEMIC:**

<b>Years Inclusive</b>	<b>Name and Location of Institution or Organization</b>	<b>Rank/Title Position</b>
1986-1991	New York Zoological Society (radio telemetry in eggs)	Consultant
1986-1991	Health Science Center at Syracuse (SUNY) (electronic hardware for radiology)	Consultant
1985-1986	Courant Institute, New York University (computer vision software)	Software Engineer
1980-1984	Woods Hole Oceanographic Institute (onboard systems for <u>Deep Submersible Alvin</u> )	Software Engineer
1979	Falmouth Hospital, Falmouth, MA Emergency Room	Orderly
1978	Massachusetts Institute of Technology Experimental Music Studio (now "Media Lab")	Software Engineer
1976	Harvard University Psychology Department	Hardware Engineer

**UNDERGRADUATE SUMMER JOBS:**

1975	Stanford University Biomedical Engineering Laboratory	Research Assistant
1974	Harvard University Biology Department	Research Assistant
1972-3	Excitable Membrane Training Program Marine Biological Laboratories, Woods Hole, Mass.	Research Assistant

**AWARDS AND HONORS**

2006 Elected to represent Bioengineering on the *Faculty Honor Roll* by the University of Pittsburgh Engineering Student Council.

2006 Elected Fellow of the *American Institute for Medical and Biological Engineering (AIMBE)*.

2004 *Chancellor's Distinguished Research Award in the Junior Scholar category*.

2004 Elected to represent Bioengineering on the *Faculty Honor Roll* by the University of Pittsburgh Engineering Student Council.

1998 *NSF Recognition Award for the Integration of Research and Education (RAIRE)*, Duke University, "Reality.java: How students learn by creating educational software," G. Stetten, G. Wang, V. Pitiyanuvath, S. Guthrie, April 18, 1998.

1993 *Penstock Toko R.F./Microwave "Wireless" Design Contest*, 2nd place. Radio telemetric egg.

1992 *Nominated for Discover Magazine Award For Technological Innovation In The Category Of The Environment*, for the Radio Telemetric Egg, October 1992.

**CERTIFICATION AND LICENSURE**

1992 North Carolina Medical License #R22843

**MEMBERSHIPS IN PROFESSIONAL AND SCIENTIFIC SOCIETIES****Organization**

Institute of Electrical and Electronic Engineering (IEEE)

American Institute for Medical and Biological Engineering (AIMBE)

American Society of Engineering Education (ASEE)

Medical Image Computing and Computer Assisted Intervention (MICCAI) Society

**RESEARCH FUNDING****Current Grants and Contracts:**

(Co-PI with Ralph Hollis) *Robotics Institute Collaborative Challenge Award* (1<sup>st</sup> place), \$10,000, "Scaled Teleoperation with Haptic Feedback and Registered Virtual Images," Nov. 18, 2006 – Nov. 2007

(PI) *Bioengineering Research Grant NIH*, \$1,676,744, "Tomographic Reflection for Image Guided Intervention." (1-R01-EB00860-1) 5/15/03 – 3/15/08.

(PI) *Bioengineering Research Grant NIH*, \$1,015,203, "Guiding Vascular Access with the Sonic Flashlight." (1-R01-

HL074285-01) 7/01/03 – 6/30/07.

- (PI) *NSF Robotics and Human Augmentation*, \$350,000, “Augmenting Visual Perception with Real Time Tomographic Holography,” (0308096) 7/1/03 – 6/30/07
- (PI) *Carnegie Mellon University Seed Fund Grant*, \$50,000, "System for Location-Merging of 3D Ultrasound Images with Human Vision: the Sonic Flashlight," 10/99 – present.
- (PI) *Bicentennial Alumni Faculty Fellowship*, \$30,000, for outstanding productivity as a member of the faculty, School of Engineering, University of Pittsburgh, September 1, 2005 – August 31, 2007
- (PI) *Office of Technology Management, University of Pittsburgh, “Gap” Funding*, \$30,000, Applying the Sonic Flashlight to the Guidance of Breast Tumor Biopsy, 1/1/06-12/31/06.

**Submitted Grants and Contracts:**

- (PI, Michael Boninger) *NIH R21 Acute Rotator Cuff Tendon Changes Associated with Wheelchair Propulsion* (10% effort)
- (PI) *NIH R21 Holographic Sonic Flashlight for Guiding Interventional Procedures*, \$900,000 direct, \$1,231,790 total, (25% effort), 7/15/07-7/14/10.
- (PI) *NIH R21 Developing a Sonic Flashlight for Breast Biopsy*, \$900,000 direct, \$1,239,905 total, (25% effort), 7/15/07-7/14/10.

**Past Grants and Contracts:**

- (PI) *Bicentennial Alumni Faculty Fellowship*, \$24,000, for outstanding productivity as a junior member of the faculty, School of Engineering, University of Pittsburgh, September 1, 2003 – August 31, 2005.
- (PI) *National Library of Medicine*, \$100,000, “Real Time 3D Echocardiographic Data with Semi-Automated Boundary Tracking Algorithms,” 9/30/02 – 9/30/04.
- (PI) *National Library of Medicine*, \$88,187, “Methods in Medical Image Analysis: An ITK-Based Course with Deliverable Algorithms,” 9/30/02 – 9/30/04.
- (PI on sub-contract to UNC, Chapel Hill) *National Library of Medicine*, \$180,884, "Functions, Classes and Visual Programming for Medical Image Processing," subcontract of N01-LM-0-3501 with UNC, Chapel Hill, 11/99 - 6/02
- (PI) *N.I.H. Clinical Investigator Development (K-08) Award*, \$325,560, "Visualization and Image Analysis for 3-D Ultrasound," K08-HL03220 4/1/95 - 3/31/00.
- (PI) *Whitaker Foundation Biomedical Engineering Research Grant*, \$112,116, "Rapid Tracking of Cardiac Chamber Volume with Matrix-Array 3D Ultrasound," 12/1/94 - 11/30/97.
- (PI) *Lord Foundation*, \$9,999, "Establishing a New Undergraduate Engineering Course in Graphics Simulation Using C++," 4/15/97 - 4/14/98.
- (PI) *Lord Foundation*, \$10,000, "Visualization and Image Analysis Laboratory." 4/15/94 - 4/14/96.
- (PI) *Lord Foundation*, \$8,000, "Duke University Visualization and Image Analysis Laboratory: Hardware Enhancement." 4/15/94 - 4/14/95.

**Past Equipment Grants:**

- Mitsubishi*, hardware and funds \$10,000, to develop visualization system for 3D ultrasound using their prototype 3D volume-rendering board for Pentium platform, 1998.
- Microsoft Instructional Lab Grant*, software, \$137,137, for new course developing instructional software, *Reality.JAVA*. (Stetten, Guthrie, Wang, and Pitiyanuvath), 1997.
- Stereo Graphics*, \$1000, CrystalEyes Stereoscopic System for 3D Ultrasound, 1994.
- Silicon Graphics*, free loan of two graphics workstations, approx. \$20,000 and \$50,000, 1994.
- Apple Computer*, software, \$68,800, for prototype diffuse infrared wireless classroom, 1993.

*Photonics Corporation*, wireless networking hardware \$18,000, for first prototype classroom of notebook computers connected by a diffuse infrared network, 1993.

*Farallon Computing*, software, \$8,027, for networking wireless classroom, 1993.

## PUBLICATIONS

### Peer Reviewed Journal Articles:

#### Published:

- 1) R. Klatzky, B. Wu, D. Shelton, G. Stetten, "Learning to perform actions in near space under perceptual vs. cognitive control," (accepted to *ACM Transactions on Applied Perception*).
- 2) W. Chang, N. Amesur, R. Klatzky, G. Stetten, "The Sonic Flashlight Is Faster than Conventional Ultrasound Guidance to Learn and Use For Vascular Access on Phantoms," *Radiology*, 241 (3), December 2006.
- 3) S. Clanton, D. Wang, V. Chib, Y. Matsuoka, G. Stetten, "Optical Merger of Direct Vision with Virtual Images for Scaled Teleoperation," *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, Vol. 12, No. 2, March/April 2006.
- 4) B. Wu, R. Klatzky, D. Shelton, G. Stetten, "Psychophysical Evaluation of In-Situ Ultrasound Visualization," Special Issue on Haptics, Virtual and Augmented Reality, *IEEE Transactions on Visualization and Computer Graphics (TVCG)*, vol. 11, no. 6, pp. 684-693, November/December 2005.
- 5) G. Stetten, A. Cois, W. Chang, D. Shelton, R. Tamburo, J. Castellucci, O. von Ramm, "C-mode Virtual Image Display for a Matrix Array Ultrasound Sonic Flashlight," (1 of 12 papers from MICCAI, invited to be in a special issue) *Academic Radiology*, vol. 12, no. 5, pp 535-543, May 2005.
- 6) D. Shelton, G. Stetten, S. Aylward, L. Ibanez, A. Cois, C. Stuart, "Teaching Medical Image Analysis with the Insight Toolkit," *Medical Image Analysis* vol. 9, issue 6, pp. 605-611, December 2005.
- 7) W. Chang, M. Horowitz, G. Stetten, "Intuitive intra-operative ultrasound guidance using the Sonic Flashlight, a novel ultrasound display system," *Neurosurgery*, vol. 56, pp. ONS 434-437, April 2005.
- 8) W. Chang, G. Stetten, L. Lobes, D. Shelton "Guidance of Retrobulbar Injection with Real Time Tomographic Reflection," *Journal of Ultrasound in Medicine*, vol. 21, pp. 1131-1135, 2002.
- 9) R. Tamburo, G. Stetten, "Gradient-Oriented Profiles for Automated Unsupervised Boundary Classification and their Application to Core Atoms Towards Shape Analysis," *International Journal of Image and Graphics* vol. 1, no. 4, pp. 659-680, 2001.
- 10) G. Stetten, R. Drezek, "Active Fourier Contour Applied to Real Time 3D Ultrasound of the Heart," *International Journal of Image and Graphics* vol. 1, no. 4, pp. 647-658, 2001.
- 11) T. Irvine, G. Stetten, V. Sachdev, A. Zetts, M. Jones, Y. Mori, C. Ramsperger, J. Castellucci, A. Kenny, J. Panza, O.von Ramm, D. Sahn, "Quantification of Aortic Regurgitation by Real-Time 3D Echocardiography in a Chronic Animal Model: Computation of Aortic Regurgitant Volume as the Difference Between Left and Right Ventricular Stroke Volumes," *Journal of the American Society of Echocardiography* vol. 14, no. 11, pp. 1112-1118, November, 2001.
- 12) G. Stetten, R. Tamburo, "Real-Time 3D Ultrasound Methods for Shape Analysis and Visualization," *Methods: Special Issue on Real-Time Signal Processing in the Neurosciences*, vol. 25, no. 2, pp. 213-222, October, 2001.
- 13) G. Stetten, V. Chib, "Overlaying Ultrasound Images on Direct Vision," *Journal of Ultrasound in Medicine* vol. 20, no. 3, pp. 235-240, 2001.
- 14) J. Kisslo, B. Firek, T. Ota, D.H. Kang, C.E. Fleishman, G. Stetten, J. Li, C.J. Ohazama, D.B. Adams, C. Landolfo, R. Ryan, and O.T. von Ramm: Real-time Volumetric Echo: The Technology and the Possibilities. *Echocardiography*. 17:773-779, 2000.
- 15) G. Stetten, S. Pizer, "Medial Node Models to Identify and Measure Objects in Real-Time 3D

- Echocardiography," *IEEE Transactions on Medical Imaging*, Vol. 18, No. 10, pp 1025-1034, Oct. 1999.
- 16) T. Ota, C. Fleishman, M. Strub, G. Stetten, C. Ohazama, O. von Ramm, J. Kisslo, "Real-Time Three Dimensional Echocardiography: Feasibility of Dynamic Right Ventricular Volume Measurement Using Saline Contrast," *American Heart Journal*, vol. 137, pp 958-66, 1999.
  - 17) M. Collins, MD, A. Hsieh, C. Ohazama, T. Ota, G. Stetten, C. Donovan, J. Kisslo, T. Ryan, "Assessment of Regional Wall Motion Abnormalities with Real-Time 3-Dimensional Echocardiography," *Journal of the American Society of Echocardiography*, vol. 12, no. 1, pp. 7-14, January, 1999.
  - 18) G. Stetten, T. Ota, C. Ohazama, C. Fleishman, J. Castelucci, J. Oxaal, T. Ryan, J. Kisslo, O. von Ramm, "Real-Time 3D Ultrasound: A New Look at the Heart," *Journal of Cardiovascular Diagnosis and Procedures*, vol. 15, no. 2, pp. 73-84, August, 1998.
  - 19) K. Lohmann, D. Pentcheff, G. Stetten, G. Nevitt, R Zimmer-Faust, "Magnetic orientation by spiny lobsters: Experiments with an undersea coil system," *Journal of Experimental Biology*, vol. 198, no. 10, pp. 2041-2048, 1995.
  - 20) G. Stetten, R. Morris, "Shape Recognition with the Flow Integration Transform," *Information Sciences* vol. 85, pp 203-221, 1995.
  - 21) G. Stetten, S. Guthrie, "Wireless Infrared Networking in the Duke Paperless Classroom," *Technological Horizons in Education Journal*, vol. 23, no. 3, pp. 87-90, October, 1995. (<http://www.thejournal.com/magazine/vault/A1172.cfm>)
  - 22) G. Stetten, "Doctor's Heart," Resident's Forum, *Journal of the American Medical Association*, vol. 273, no. 14, p. 1076f, April 12, 1995 (<http://www.stetten.com/george/publications/doctorheart.html>)
  - 23) M. S. Landy, L. Manovich, G. Stetten, "Applications of the EVE software for visual modeling," *Vision Research*, vol. 30(2), pp. 329-38, 1990.
  - 24) M. Landy, L. Manovich, G. Stetten, "All about EVE: The Early Vision Emulation software," *Behavior Research Methods, Instruments, & Computers*, vol. 21, pp. 491-501, 1989.
  - 25) "Alvin's memory," description of computer system onboard Deep Submersible Alvin, *Oceanus*, Vol. 27, no. 3, Fall, 1984.

#### **Submitted:**

#### **Book Chapters:**

- 1) T. Yoo, G. Stetten, W. Lorensen, "Basic Image Processing," Chapter 3, Insight into Images: Principles and Practice for Segmentation, Registration, and Image Analysis. A. K. Peters, 2004.
- 2) V. Chib, G. Stetten, "Real Time Tomographic Reflection," Encyclopedia of Biomaterials and Biomedical Engineering, editors by, Gary E. Wnek, Gary L. Bowlin (in press).
- 3) G. Stetten, "Visual System," chapter in Biomedical Imaging, edited by Karen M. Mudry, Robert Plonsey, Joseph D. Bronzino (reprinted from Guidelines for Biomedical Engineering Handbook) *CRC Press*, Boca Raton, Florida, 2003.
- 4) J. Kisslo, T. Ota, C. Fleishman, G. Stetten, J., C. Ohazama, T. Ryan, D. Adams, C. Landolfo, and O. von Ramm, "Real-time volumetric echocardiography: Everything at once," chapter in Three-Dimensional Echocardiography of the Heart and Coronary Arteries. Van Zuiden Communications. The Netherlands. 2000. pp. 37-50.
- 5) G. Stetten, "Visual System," chapter in Guidelines for Biomedical Engineering Handbook; ed. J. Bronzino; 1st ed. 1995, 2nd ed. 1998, 3<sup>rd</sup> ed. 2004, *CRC Press*, Boca Raton, Florida. pp. 33-42.
- 6) G. Stetten, "3D Medical Imaging: Real Data," chapter in PC Graphics Unleashed, SAMS Publishing, Indianapolis, 1994.

#### **Refereed Proceedings:**

- 1) R. Tamburo, G. Siegle, G. Stetten, C.A. Cois, K. Rockot, J. Galeotti, C. Reynolds, H. Aizenstein, "Localizing amygdala structure differences in late-life depression," *ISBI 2007*.
- 2) C.A. Cois, K. Rockot, J. Galeotti, R. Tamburo, D. Gottlieb, J. Mayer, A. Powell, M. Sacks, G. Stetten, "Automated segmentation of the right heart using an optimized shells and spheres algorithm," *ISBI 2007*.
- 3) D. Shelton, B. Wu, R. Klatzky, and G. Stetten, "Design and calibration of a virtual tomographic reflection system," *ISBI 2007*.
- 4) D. Wang, R. Klatzky, N. Amesur, George Stetten, "Carotid Artery and Jugular Vein Tracking and Differentiation using Spatiotemporal Analysis," *MICCAI 2006*, Lecture Notes in Computer Science, vol. 4190, pp. 654-661.
- 5) K. Zawrotny, A. Craig, D. Weiser, R. Klatzky, and G. Stetten, "Fingertip Vibratory Transducer for Detecting Optical Edges using Regenerative Feedback," *Haptic Interfaces for Virtual Environment and Teleoperator Systems, IEEE Virtual Reality 2006*, pp. 373-374, Arlington VA, March 2006.
- 6) J. Galeotti, G. Stetten, "N-Dimensional Path Optimization: The Implementation of a Novel Algorithm in ITK," special issue for *MICCAI 2005 Workshop on Open-Source Software*, published online in *The Insight Journal*, <http://hdl.handle.net/1926/42>
- 7) J. Galeotti, G. Stetten, "Creation and Demonstration of a Framework for Handling Paths in ITK," presented at *MICCAI 2005 Workshop on Open-Source Software*, published online in *The Insight Journal*, <http://hdl.handle.net/1926/40>
- 8) D. Wang, B. Wu, G. Stetten, "A Laser Needle Guide for the Sonic Flashlight," *Medical Image Computing and Computer-Assisted Intervention Conference*, Oct. 26-29, 2005, Palm Springs, CA (# 181).
- 9) G. Shukla, B. Wu, D. Schwartzman, G., Stetten, "The Sonic Penlight for Guidance of Superficial Subdermal Access," *Medical Image Computing and Computer-Assisted Intervention Conference*, Oct. 26-29, 2005, Palm Springs, FL (# 542).
- 10) A. Nowatzky, D. Shelton, J. Galeotti, G. Stetten, "Extending the Sonic Flashlight to Real Time Tomographic Holography," AMI-ARCS 2004, *Workshop for Augmented environments for Medical Imaging including Augmented Reality in Computer-aided Surgery*, Rennes, France, September 30, 2004, editors: Marie-Odile Berger, Nassir Navab, proceedings (<http://ami2004.loria.fr/>), paper (<http://ami2004.loria.fr/PAPERS/23eontetetet.pdf>)
- 11) S. Allin, J. Galeotti, G. Stetten, S. Dailey, "Enhanced snake based segmentation of vocal folds," *IEEE International Symposium on Biomedical Imaging*, April, 2004, Arlington, VA.
- 12) W. Chang, N. Amesur, M. Horowitz, G. Stetten, "Refining the sonic flashlight for interventional procedures," *IEEE International Symposium on Biomedical Imaging*, April, 2004, Arlington, VA.
- 13) S. Clanton, D. Wang, Y. Matsuoka, D. Shelton, G. Stetten, "Novel machine interface for scaled telesurgery," *SPIE Medical Imaging*, vol. 5367, pp. 697-704., San Diego, Feb. 2004.
- 14) R. Tamburo, A. Cois, D. Shelton, G. Stetten, "Novel method to automatically identify medial node correspondences between two images," *SPIE Medical Imaging*, vol. 5367, pp. 1225-1235, San Diego, Feb 2004.
- 15) G. Stetten, A. Cois, W. Chang, D. Shelton, R. Tamburo, J. Castellucci, O. von Ramm, "C-mode Virtual Image Display for a Matrix Array Ultrasound Sonic Flashlight," *Medical Image Computing and Computer-Assisted Intervention – MICCAI 2003. Lecture Notes in Computer Science*, vol. 2879, pp. 336-343.
- 16) R. Tamburo, A. Cois, D. Shelton, G. Stetten, "Medial Node Correspondences for Automatic Non-Rigid Registration," *Second International Workshop on Biomedical Image Registration*, June, 2003, Philadelphia, *Lecture Notes in Computer Science*, vol. 2717, pp. 337-348.
- 17) G. Stetten, D. Shelton, W. Chang, V. Chib, R. Tamburo, D. Hildebrand, L. Lobes, J. Sumkin, "Towards a clinically useful Sonic Flashlight," *IEEE International Symposium on Biomedical Imaging 2002* (on CD).
- 18) G. Stetten, V. Chib, D. Hildebrand, J. Bursee, "Real Time Tomographic Reflection: Phantoms for Calibration and Biopsy," *Proceedings of the IEEE and ACM International Symposium on Augmented*

*Reality*, New York City, Oct 29-30, 2001, pp. 11-18.

- 19) G. Stetten, V. Chib, "Magnified Real-Time Tomographic Reflection," *Medical Image Computing and Computer-Assisted Intervention – MICCAI 2001. Lecture Notes in Computer Science*, vol. 2208, pp. 683-690, 2001.
- 20) R. Tamburo and G. Stetten, "Gradient Oriented Profiles for Unclassified Boundary Classification," *IEEE Proceedings of the Applied Imagery Pattern Recognition (AIPR) Workshop*, Washington, D.C., Oct. 16-18, 2000, pp. 206-212.
- 21) G. Stetten, V. Chib, R. Tamburo, "System for Location-Merging Ultrasound Images with Human Vision," *IEEE Proceedings of the Applied Imagery Pattern Recognition (AIPR) Workshop*, Washington D.C., 2000, pp. 200-205.
- 22) G. Stetten, S. Pizer, "Medial-Guided Fuzzy Segmentation," *Medical Image Computing and Computer-Assisted Intervention – MICCAI 2000. Lecture Notes in Computer Science*, vol. 1935, pp. 226-235.
- 23) G. Stetten, S. Pizer, "Automated Identification and Measurement of Objects via Populations of Medial Primitives, with Application to Real Time 3D Echocardiography," *XVth International Conference on Information Processing in Medical Imaging (IPMI)*, June 1999. *Lecture Notes in Computer Science*, vol. 1613, pp. 84-97.
- 24) G. Stetten, R. Landesman, S. Pizer, "Core-Atoms and the spectra of scale," *SPIE Medical Imaging Conference*, Feb., 1997, vol. 3034, part 2, pp. 642-652, also *Technical Report TR97-006*, University of North Carolina, Department of Computer Science.
- 25) G. Morsey, G. Stetten, O. von Ramm, "Detection and quantification of true 3D motion components of the myocardium using 3D speckle tracking in volumetric ultrasound scans: simulations and initial experimental results," *SPIE Medical Imaging Conference*, Feb., 1997, vol. 3033, pp. 346-353.
- 26) R. Drezek, G. Stetten, T. Ota, C. Fleishman, E. Lily, C. Lewis, T. Ryan, D. Glower, J. Kisslo, O. von Ramm, "An active contour based on the elliptical Fourier series, applied to matrix-array ultrasound of the heart," *SPIE Proceedings of the 25th Annual Applied Imagery Pattern Recognition Workshop*, Washington DC, Oct., 1996, vol. 2962, pp. 26-34.
- 27) G. Stetten, M. Caines, C. Ohazama, O.T. von Ramm, "The Volumetricardiogram (VCG): Volume Determination of Cardiac Chambers using 3D Matrix-Array Ultrasound." *Proceedings of the SPIE Symposium on Medical Imaging*. 1995, San Diego, vol. 2432, pp. 185-196.
- 28) G. Stetten, F. Koontz, C. Sheppard, C. Koontz, "Radio Telemetric Egg to Measure Temperature, Humidity, and Orientation in the Nest," *Proceedings of the Thirteenth International Symposium on Biotelemetry*, pp. 216-222, Williamsburg, VA, March 26-31, 1995,
- 29) G. Stetten, M. Caines, O.T. von Ramm, "The Flow Integration Transform, detecting shapes in Matrix-Array 3D Ultrasound Data," *Proceedings of the IS&T/SPIE's Symposium on Electronic Imaging: Science and Technology*. Feb. 1995, San Jose, vol. 2424, pp. 242-252.
- 30) G. Stetten, R. Morris, M. Caines, "The Flow Integration Transform (FIT) for 2D and 3D Shape-Detection," *Proceedings of the Joint Conference on Information Sciences*. 1994, Pinehurst, NC. pp. 393-396 (invited paper).
- 31) M. Anderson, P. Freiburger and G. Stetten, "Application of programmable logic in diagnostic ultrasound imaging: Highly parallel signal processing," Beam steering custom Field Programmable Gate Arrays for matrix array ultrasound, *Proceedings of the 4th Annual Programmable Logic Devices Design Conference*, San Jose, CA., 1994.
- 32) G. Stetten, F. Koontz, C. Sheppard, C. Koontz, "Telemetric egg for monitoring nest microclimate of endangered birds," *Proceedings of the International Telemetry Conference*. pp. 321-327, Las Vegas, October, 1990.
- 33) G. Stetten, F. Koontz, C. Sheppard, and C. Koontz, "Biotelemetric monitoring of White-Naped Crane (*Grus vipio*) nest microclimate in captivity," *Annual Proceedings of the American Association of Zoos, Parks, and Aquariums*, 1989, pp. 264-271.

**Submitted:**

- 34) A. Cois, R. Tamburo, M. Sacks, J. Galeotti, M. Chen, G. Stetten, "Shells and Spheres: A Framework for Variable-Scale Statistical Image Analysis," submitted to IPMI 2007.

**Patents:**

- U.S. Patent Submitted*, G. Stetten, A. Nowatzky, "Combining Tomographic Images in situ with Direct Vision Using a Holographic Optical Element," US Patent Application 20030199765, Continuation in Part to Patent, 6,599,247, filed April, 2002.
- U.S. Patent Submitted*, C. Riviere, N. Patronik, M. Zenati, and G. Stetten, "Robot for Minimally Invasive Interventions," patent filed November 5, 2004.
- U.S. Patent* no. 6,599,247, G. Stetten, "System and Method for Location-Merging of Real-Time Tomographic Slice Images with Human Vision," filed Oct. 11, 2000, issued, July 29, 2003.
- U.S. Patent* no. 5,550,933, G. Stetten, "Quadrature Shape Detection Using the Flow Integration Transform," granted August 27, 1996.

**Abstracts and Posters:**

- 1) D. Wang, N. Amesur, D. Weiser, W. Chang, A. Zajko, G. Stetten, "Improving image quality of the sonic flashlight for venous access," podium presentation *ARRS 2007*.
- 2) D. Wang, N. Amesur, D. Weiser, W. Chang, G. Stetten, "Improving image quality for the Sonic Flashlight in sterile procedures." The 57th Annual Convention of the American Medical Student Association (poster session), March 7–11, 2006, Washington, DC, United States
- 3) G. Shukla, B. Wu, D. Schwartzman, G. Stetten, "The Sonic Penlight for Guidance of Superficial Subdermal Access," American Medical Association-Medical Student Section Poster Competition, November 10th, 2006, Las Vegas, NV.
- 4) R. Tamburo, G. Siegle, G. Stetten, C.A. Cois, C. Reynolds, H. Aizenstein, "Amygdala Shape Morphometry in Late-Life Depression," *Science 2006*, Pittsburgh, Oct. 5-6, 2006.
- 5) B. Wu, R. L. Klatzky, D. Shelton, G. Stetten, "Interaction of Visual and Haptic Cues in the Image-based Perception of Depth," *Vision Sciences Society Meeting*, Sarasota, FL., May 5-10, 2006 (abstract VSS#284).
- 6) R. Klatzky, B. Wu, D. Shelton, and G. Stetten, "Superiority of In-situ Ultrasound Visualization for Medical Intervention when Action Varies," *Haptic Interfaces for Virtual Environment and Teleoperator Systems, IEEE Virtual Reality 2006*, Arlington VA, 25-26 March 2006 (poster presentation only – not to be published in proceedings).
- 7) D. Weiser, G. Stetten, "BLIP: A New Tool for Instrumentation Education," 2005 *BMES Annual Fall Meeting* Baltimore, MD. Abstract# 142374.
- 8) W. Chang, N. Amesur, D. Wang, A. Zajko, G. Stetten, "First Clinical Trial of the Sonic Flashlight – Guiding Placement of Peripherally Inserted Central Catheters," 2005 meeting of the *Radiological Society of North America*, November 2005, Chicago, Illinois. Paper Number SSJ03-02.
- 9) R. Klatzky, B. Wu, D. Shelton, G. Stetten, "Efficacy of Image-Guided Action is Controlled by Perception," *Vision Sciences Society Meeting*, 2005, Sarasota, FL., May 6-11, 2005.
- 10) W. Chang, N. Amesur, A. Zajko, G. Stetten, "The Sonic Flashlight Is Faster To Learn And Use Compared To Conventional Ultrasound Guidance For Vascular Access," Abstract no. 226, 105th annual meeting of the American Roentgen Ray Society, May 15-20, 2005, New Orleans, LA.
- 11) W. Chang, N. Amesur, A. Zajko, G. Stetten, "Cadaveric central venous access using the Sonic Flashlight, a novel ultrasound display system," 2004 meeting of the *Radiological Society of North America*, abstract ID: 4404715, Presentation Code: 1539VI-p, Chicago, December, 2004.

- 12) D. Shelton, R. Klatzky, G. Stetten, "Method for assessing augmented reality needle guidance using a virtual biopsy task," Abstracts of the *IEEE International Symposium on Biomedical Imaging*, p. 13, April, 2004, Arlington, VA.
- 13) W.M. Chang, N.B. Amesur, A.B. Zajko, G.D. Stetten, "Sonic Flashlight: A new ultrasound display system that makes vascular access easier." *Society of Interventional Radiology, 29th Annual Scientific Meeting*, Phoenix, AZ, March 25-30, 2004. Abstract No. 64, *Journal of Vascular and Interventional Radiology*, Feb., 2004, vol. 15, no. 2, part 2, p. S166. (Winner of competitive student travel award).
- 14) G. Stetten, A. Nowatzky, D. Shelton, "Augmenting visual Perception with Real-Time Tomographic Holography," 2003 NSF Principle Investigator Workshop on Robotics and Computer Vision, Las Vegas, Nevada, October 26-27, 2003.
- 15) D. Shelton, R. Klatzky, G. Stetten, "Virtual Phantoms for the Sonic Flashlight," *Medical Image Perception Conference*, Duke University, Sep 11-14, 2003.
- 16) G. Stetten, D. Shelton, W. Chang, R. Tamburo, V. Chib, A. Cois, R. Hollis, A. Rizzi, L. Lobes, D. Schwartzman, "Progress Towards a Clinically Useful Sonic Flashlight," *Biomedical Imaging Research Opportunities Workshop*, Washington, D.C., Jan. 31 2003. Published in *Academic Radiology*, Po-topic IV-16, vol. 10, no. 8, pp. 959, August 2003.
- 17) S. Mulukutla, G. Stetten, D. Jacques, J. Gorcsan, "Quantification of Left Ventricular Regional Phase Asynchrony in Patients with Left Bundle Branch Block Using Tissue Doppler Echocardiography." *American Heart Association Scientific Sessions, 2000*
- 18) J. Gorcsan, S. Mulukutla, H. Wang, D. Jacques, G. Stetten, A. Feldman, "Measurement of Left Ventricular Wall Motion Asynchrony in Patients with Left Bundle Branch Block Using Tissue Doppler Echocardiography." *Heart Failure Society of America 2000*
- 19) T. Irvine, M. Jones, V. Sachdev, G. Stetten, J. Castelluci, R. Szwarc, D. Ritscher, J. Panza, "Determination of Right Ventricular Diastolic and Systolic Cavity Volumes and Stroke Volumes by Real-Time 3D Ultrasound: Validation Studies Using Endocardial Crystal Array 3D Maps, Conductance Catheters and Electromagnetic Flow Meters, *AHA 72<sup>nd</sup> Scientific Sessions*, 1999.
- 20) G. Stetten, T. Irvine, D. Ritscher, O.T. von Ramm, J. Panza, V. Sachdev, J. Castellucci, M. Jones, D. Sahn, "Improved accuracy for a semi-automated method for computing right ventricle (RV) cavity volumes from Real Time 3D Echo: Comparison studies to ultrasonic crystals in an open-chest animal model." *American College of Cardiology 48th Scientific Sessions*. 914-2, 1999.
- 21) V. Sachdev, G. Stetten, M. Jones, O.T. von Ramm, J. Castellucci, D. Ritscher, T. Irvine, J. Panza, D. Sahn, "Validation studies for Real-Time 3D Echocardiographic determination of Left Ventricular (LV) diastolic and systolic cavity and stroke volumes: Comparisons of digital sonomicrometric arrays, conductance catheter and EM flow meter measurements." *American College of Cardiology 48th Scientific Sessions*.
- 22) D. Ritscher, T. Irvine, G. Stetten, A. Zetts, O.T. von Ramm, Srdjan Nikolic, J. Panza, V. Sachdev, M. Jones, D. Sahn, "Validation of endocardial ultrasonic crystal array methods for RV and LV cavity and stroke volume determinations compared to electromagnetic flow meters and conductance catheters in a study of sheep with chronic aortic regurgitation." *American College of Cardiology 48th Scientific Sessions*. 891-5, 1999.
- 23) D. Sahn, A. Zetts, M. Jones, T. Irvine, G. Stetten, O.T. von Ramm, C. Ramsperger, J. Castellucci, "Calculation of aortic regurgitant stroke volume from Real-Time 3D ultrasound images as the difference between left and right ventricular 3D determined stroke volumes in chronic animal model of aortic regurgitation: A new method with potentially wide application in cardiology." *AHA 71st Scientific Sessions*, 1998.
- 24) M. Shu, A. Shah, M. Womack, B. Atkins, G. Stetten, S. Rednam, O.T. von Ramm, P. Smith, D. Glower, A. Pasipoularides, "Diastolic right ventricular vortical flow: Increased symmetry in volume overload with paradoxical septal motion." *AHA 71st Scientific Sessions*, 1998.
- 25) J.S. Li, C.E. Fleishman, C. Ohazama, G. Stetten, A.R. Bengur, S.P. Sanders, T. Ryan, J. Kisslo, "Evaluation of ventricular outflow tract abnormalities using real-time three dimensional echocardiography." *American*

*College of Cardiology 46th Annual Scientific Session, March 1998.*

- 26) T. Ota, C.J. Ohazama, C.E. Fleishman, G. Stetten, T. Ryan, C.W. Lewis, D.D. Glower, O.T. von Ramm, J. Kisslo, "Novel determination of left ventricular volume by tracing arbitrary planes using real-time, 3D echocardiography: in vitro and in vivo validation." *AHA 70th Scientific Sessions, 1997.*
- 27) M. Shu, B.R. Ramaswami, S. Sha, C. Fleishman, T. Ota, P.T. Pennington, J.E. Bischoff, G. Stetten, O.T. von Ramm, A.D. Pasipoularides, "Tricuspid velocity profiles reflect RV diastolic wall motion abnormalities: real-time 3D echocardiography and computational fluid dynamics simulations." *AHA 70th Scientific Sessions, 1997.*
- 28) Morsy, G. D. Stetten, and O. T. Von Ramm, "Tissue motion detection and quantification using 3D speckle tracking in volumetric ultrasound scans: experimental results," *22nd International Symposium on Ultrasonic Imaging and Tissue Characterization, Arlington VA, June, 1997. Abstract, Ultrasonic Imaging, vol. 19, no. 1, pp. 62-63.*
- 29) T. Ota, C. E. Fleishman, G. Stetten, C. J. Ohazama, C. W. Lewis, D. D. Glower, T. Ryan, O. T. v. Ramm, and J. Kisslo "Manual and semiautomated measurement of left ventricular volume using real-time, three-dimensional echocardiography in vivo," *American College of Cardiology Annual 46th Scientific Session, 1996, Abstract 1072-27, JACC, vol. 29, no. 2, suppl. A, p. 479A, February 1997.*
- 30) J. Ohazama, G. Stetten, C. E. Fleishman, T. Ota, C. W. Lewis, E. Morris, T. Ryan, O. T. v. Ramm and J. Kisslo, "A new, rapid visualization method for detection of ischemic risk volume by three-dimensional echocardiography," *American College of Cardiology 46th Annual Scientific Session, 1996, Abstract 705-6, JACC, vol. 29, no. 2, suppl. A, p. 57A, February 1997.*
- 31) T. Ota, C. E. Fleishman, J. Li, G. Stetten, C. J. Ohazama, O. T. v. Ramm and J. Kisslo, "Accuracy of manual and semiautomated methods for volume determination by real-time, three-dimensional echocardiography," *AHA 69th Scientific Sessions, 1996, abstract #1235, p I-212.*
- 32) M. Shu, G. D. Stetten, C. J. Ohazama, J. E. Bischoff, B. Rarnaswami, O. T. v. Ramm and A. D. Pasipoularides, "Digital geometric models using biventricular real-time 3D echocardiography," *AHA 69th Scientific Sessions, 1996, abstract #1230, p. I-211.*
- 33) E. Fleishman, J. Li, T. Ota, C. J. Ohazama, G. Stetten, D. Adams, O. T. v. Ramm and J. Kisslo, "Identification of congenital heart defects using real-time three-dimensional echo in pediatric patients," *AHA 69th Scientific Sessions, 1996, abstract #2423, p. I-416.*
- 34) E. Fleishman, T. Ota, C. W. Lewis, R. E. Lilly, E. Morris, S. Borges-Neto, C. J. Ohazama, G. Stetten, D. D. Glower, O. T. v. Ramm, J. Kisslo and T. Ryan, "Quantitative assessment of LV ischemic risk volume using real-time three-dimensional echocardiography," *AHA 69th Scientific Sessions, 1996, abstract #4014, p. I-687.*
- 35) E. Fleishman, T. Ota, C. J. Ohazama, G. Stetten, C. W. Lewis, J. Li, O. T. v. Ramm and J. Kisslo, "Real-time three-dimensional echocardiography: Measurement of left ventricular mass in dogs," *AHA 69th Scientific Sessions, 1996, abstract #4019, p. I-688.*
- 36) T. Ota, C. Fleishman, C. J. Ohazama, G. Stetten, C.L. Lewis, D. Glower, J. Li, T. Ryan, J. Kisslo, O.T. von Ramm, "Measurement of Left Ventricular Volume by Real-Time, Three-Dimensional Echocardiography in Dogs," *AHA 69th Scientific Sessions, 1996, abstract #4018, p. I-379.*
- 37) M. Collins, A. Hsieh, C. J. Ohazama, T. Ota, G. Stetten, M. Strub, C. L. Donovan, O. T. v. Ram, J. Kisslo and T. Ryan, "Assessment of regional wall motion abnormalities using real-time 3D echocardiography," *AHA 69th Scientific Sessions, 1996, abstract #4018, p. I-688.*
- 38) Hsieh, M. Collins, T. Ota, C. E. Fleishman, M. Strub, C. J. Ohazama, G. Stetten, O. T. v. Ramm and T. Ryan, "Real-time 3D stress echocardiography: Description of a new technique," *AHA 69th Scientific Sessions, 1996, abstract #2617, p. I-448.*
- 39) G. Stetten, R. Drezek, C. Ohazama, O. von Ramm, "The Swath Algorithm for shape detection in Matrix Array Ultrasound," *21st International Symposium on Ultrasonic Imaging and Tissue Characterization, Arlington Virginia, June, 1996. Abstract, Ultrasonic Imaging, vol. 18, p. 55.*
- 40) G. Stetten, C. Ohazama, T. Ota, O. von Ramm, "Non-Gated Dynamic 3D Images of the Heart with Matrix-Array Ultrasound." *Society of Artificial Internal Organs (ASAIO), Washington D.C., May 1996. Journal of*

*the American Society for Artificial Internal Organs*, vol. 42: 2, p 128 (invited speaker).

- 41) T. Ota, C. Fleishman, J. Li, G. Stetten, C. Ohazama, O. von Ramm, J. Kisslo, "Real-Time 3D Echocardiography with Saline Contrast Enhancement: Methods and Possibilities: System improvements, scanning methods and normal cardiac anatomy." Abstract, *Journal of the American College of Cardiology*, (Suppl A) 405A, 1996. Presented at the 45th Annual Scientific Session of the American College of Cardiology, Orlando, Florida. March 1996.
- 42) G. Stetten, R. Morris, "Quadrature Shape Detection," *2nd International Conference on Fuzzy Theory and Technology; Proceedings Abstracts & Summaries*, Durham, NC; 1993, p. 66.

**Submitted:**

- 43) B. Wu, R. Klatzky, D. Shelton, G. Stetten, "Learning in image-guided reaching changes the representation-to-action mapping," submitted to *VSS 2007*.

**Other Publications:**

- 1) "The U.N.'s Plea on Guantánamo," letter to *The New York Times*, February 20, 2006.
- 2) Piano Solo Theme, used as segue for national broadcast of *All things Considered*, National Public Radio, multiple broadcasts including 1/5/2001, 1/19/2002, 12/10/2003, etc.
- 3) Cover photograph (of telemetric egg) for Radio, Radio, (poems by Ben Doyle), Louisiana State University Press, 2000.
- 4) "Awake at the Wheel," music CD: self-published, original songs.
- 5) "A new Method of Shape Detection in Medical Imaging," *Newsletter of the NSF / Engineering Research Center for Emerging Cardiovascular Technologies, Duke University*. Vol. 10, no. 1, February 1999.
- 6) "Voices of D.U.M.E. (Duke University Music Exchange)," music CD: self-published, collection of popular songs composed by members of the Duke community, released 11/11/98.
- 7) "Another Look at the Duke Wireless Classroom," *Technological Horizons in Education Journal*, vol. 25, no. 11, June 1998.
- 8) "Response to a story about Archimedes," *National Public Radio Morning Edition*, September 8, 1995.
- 9) Cover photograph (of telemetric egg) for *DukEngineer*, Fall 1992.
- 10) *All American Jazz, PBS Series*, Four 15-minute programs, performed solo piano and voice including original compositions, recorded at W.C.N.Y., Syracuse, NY, 1990-1991.
- 11) *Weissenbaum's Eye*, science fiction novel, self-published, Zwitter Press, 1989.
- 12) "The U.N. Peacekeeping Forces - An Expanding Role?" *U.N.A. News*, Syracuse, NY. October 1988.
- 13) "Keep Your Missiles Off The Ocean Floor," letter to *The New York Times*, August 3, 1986.
- 14) "Keeping the Ocean Bed Free From The Arms Race" letter to *The Boston Globe* July 31, 1986.
- 15) "Triumphant Mission," *The Falmouth Enterprise*, Deep Submersible Alvin mission to find Titanic, July 25, 1986.
- 16) "A Far Cry Apart," *Woods Hole Weekly*, Woods Hole Oceanographic and the Nuclear Arms Industry, March 29, 1984.
- 17) "Tremblement de terre tres doux," *M.I.T. Computer Music Journal*, Critique of composition by Francois Bayle, Summer, 1983.
- 18) "End of Sharing?" letter to the *Falmouth Enterprise*, concerning the Woods Hole School of Science, July 31, 1981.

## PROFESSIONAL ACTIVITIES

### TEACHING:

- 1) *Biomedical Imaging* (BioE 1330 – University of Pittsburgh) Required undergraduate course for Bioengineering majors (Juniors), Spring Semester, 2006.
- 2) *Linear Systems and Electronics* (BioE 1310 – University of Pittsburgh) Required undergraduate course for Bioengineering majors (Sophmores), Spring semester, 2006.
- 3) *Bioinstrumentation* (BioE 1010 – University of Pittsburgh) Required undergraduate course for Bioengineering majors (Juniors), Spring semesters, 2003-2006.
- 4) *Biosystems and Signals II* (BioE 2410 - University of Pittsburgh) Elective graduate level course in practical electronics projects, Spring semesters 2001 and 2002.
- 5) *Methods in Image Analysis* (BioE 2630 - University of Pittsburgh, 16-725 – CMU Robotics Institute) Graduate course in image analysis techniques, Fall semesters 2000-present.
- 6) *Biosystems and Signals I* (BioE 1410 - University of Pittsburgh) Required undergraduate course for Bioengineering majors (Juniors), Fall semesters 1999-2005.
- 7) *Professional Issues in Biomedical Engineering* (42-201 – CMU) Gave 2 lectures, on the MD/PhD degree and developing a technology at the university. Required undergraduate course for Biomedical Engineering majors, Fall Semester 2006.
- 8) *Research Basis of Medical Knowledge* (MSELCT 5290 – UPMC Medical Scientist Training Program) Guest seminar speaker, Spring 2005.
- 9) *Bioengineering Seminar Course, Carnegie Mellon University* (42-201), “Real Time Tomographic Reflection and the Sonic Flashlight,” Guest seminar speaker, 2001-2004.
- 10) *Simulations in JAVA* (EGR54 - Duke University) Course in which students developed software to build interactive graphical simulations, Spring semesters, 1998 and 1999.
- 11) *Engineering Music* (STH 113S - Duke University) part of Science, Technology and Human Values Program, four lectures Spring 1999.
- 12) *Independent Study* (EGR183 & EGR184 - Duke University) student projects developing wireless classroom technology and graphical simulation educational software, (Scott Guthrie, Ge Wang, Visnu Pitiyanuvath) 1994-1998.
- 13) *Simulations in C++* (EGR54 - Duke University) Course in which students developed software to build interactive graphical simulations, Spring, 1997.
- 14) *Duke Faculty Associates Program*, Faculty Associate, founded Duke University Music Exchange (DUME) for popular music composition and production, 1995-1999.
- 15) *Computational Methods in Engineering*, (EGR53 - Duke University) First experimental classroom anywhere using diffuse infrared to network notebook computers, Spring semesters, 1994-1995
- 16) *Modern Diagnostic Imaging Systems* (BME-233 - Duke University) graduate level, 2 lectures introducing Magnetic Resonance Imaging, Spring, 1993.
- 17) *Independent Study* (BME191 & BME192 - Duke University / Howard Hughes Undergraduate Fellowship) student design of radio receiver for egg telemetry, Spring and Summer, 1993.
- 18) *Computational Methods in Engineering* (EGR53 - Duke University) Fall, 1992 (weekly lecture and lab).
- 19) *Physiology* (MPHY100 - SUNY Health Science Center at Syracuse) Lecture on excitable membranes for first-year medical students, three times, 1988-1990.
- 20) *Topics in Electronics*, (G23.1008 - NYU Department of Biology) Created graduate-level course, weekly lecture and lab, Spring, 1986
- 21) *Electronics in the Biology Laboratory*, (G23.1007 - NYU Department of Biology) Created graduate-level course, weekly lecture and lab, Fall, 1985.

**GRADUATE STUDENTS SUPERVISED (Principal Ph.D. or M.S. Thesis Supervisor)**Department of Bioengineering, University of Pittsburgh, Ph.D. program

2001-2004 Wilson Chang, M.S. (U. Wisconsin)

Ph.D. granted August 2004, thesis title: *Guiding Vascular Access with the Sonic Flashlight - Preclinical Development and Validation*

1999-2006 Robert Tamburo

M.S. granted November, 2002, thesis title: *Gradient-Oriented Profiles for Automatic Unsupervised Boundary Classification and their Application to Core Atoms towards Shape Analysis.*Ph.D. granted April, 2006, thesis title: *Feature-Based Correspondences to Infer the Location of Anatomical Landmarks.*

2003-present Aaron Cois

M.S. granted May, 2006, thesis title: *Shells and Spheres: A Novel Framework for Variable Scale Statistical Image Analysis.*

2006-present Gaurav Shukla

Robotics Institute, Carnegie Mellon University, Ph.D. program

2001-present Damion Shelton,

M.S. granted December 2004.

2002-present John Galeotti, M.S. (NCSU)

M.S. granted August 2005.

Biomedical Engineering Department, Carnegie Mellon University, Ph.D. program

2004-present David Wang, M.S. (Cornell)

Department of Bioengineering, University of Pittsburgh, M.S. program

2005-present Ken Rockot

University of Pittsburgh Medical Center, M.D./Ph.D. 10 week summer program

2000, 2001 Wilson Chang, M.S.

2002, 2003 David Wang, M.S.

2003 Samuel Clanton

2004-2006 Gaurav Shukla

**UNDERGRADUATE STUDENTS SUPERVISED**Department of Bioengineering, University of Pittsburgh (~12 month Research Internship)

Vikram Chib

Matt Milazzo

Aaron Cois

Apryle Craig

David Weiser  
 Zachary Mason  
 Kimberly Zawrontny  
 Brock Nichols  
 Areej Sajjad  
 Kate Campbell

Department of Bioengineering, University of PittsburghI (~9 month Senior Design Project)

Daniel Hildebrand  
 Jeannette Bursee  
 Stephanie Foster  
 Mindy Michalerya

Duke University NSF Undergraduate Fellows 1993-1999 (~18 month Research Internship)

Richard Morris  
 Michael Caines  
 Korin Crawford  
 Rebekah Drezek  
 Roxanne Landesman  
 William Portnoy.

Duke University Undergraduate Independent Research 1993-1999

Ge (Gary) Wang  
 Visnu Pitiyanuvath  
 Scott Guthrie

Duke University Howard Hughes Undergraduate Fellows 1995 (~9 month Research Internship)

Nancy Ryan

**DISSERTATION AND THESIS COMMITTEES (not as primary advisor)**

*Doctoral Dissertation Committee:* Bioengineering, U. Pitt (David Smith, Claire Gloeckner, Prophete Charles, Erik Lindsley, Gulshan Sharma, George Engelmayr, Gusphyl Justin, Zhenghui Zhang, Ken Urish, Jennifer Mercer, Lauren Johnson), 1999-present

*Doctoral Dissertation Committee:* Robotics Institute, Carnegie Mellon University (Pedram Afshar, Bambi Brewer, Thomas Ault, Hua Zhong), 2003-present

*Doctoral Dissertation Committee:* Center for Biomedical Informatics, U. Pitt (Pinaki Mitra), 2004-present

*Masters Dissertation Committee:* Bioengineering, U. Pitt (Hiroatsu Sugimoto, Tim Noland, Christina Lee, Gulshan Sharma), 2001-present

*Masters Dissertation Committee:* Carnegie Mellon University (Pedram Afshar), 2001-present

*Doctoral Dissertation Committees Biomedical Engineering, Duke U.* (Ming Shu, Daniel Pollard, Michael Loeb, Robert Beckers) 1992-1999

*Doctoral Dissertation Committee Department of Computer Science, UNC, Chapel Hill* (Terry Yoo) 1995

**ADMINISTRATIVE, COMMITTEE, AND CONFERENCE SERVICE:**

*Graduate Student Admission Committee, Bioengineering, U. Pitt, 2007 – present.*

*University of Pittsburgh Medical Center Competitive Medical Research Fund (CMRF), reviewer, 2006.*

*Program committee for Augmented environments for Medical Imaging including Augmented Reality in Computer-aided Surgery (AMI-ARCS) 2006 Workshop, at Medical Image Computing and Computer Aided Intervention (MICCAI) 2006.*

*Faculty Search Committee, Bioengineering, U. Pitt. 2005 – present.*

*Undergraduate Assessment Committee, Bioengineering, U. Pitt. 2005 – present.*

*Chancellor's Distinguished Research Awards Committee, U. Pitt. 2005 - 2008.*

*Planning Panel on NLM Support for Clinical and Public Health Systems of the 21<sup>st</sup> Century, 2005-2006; report online at <http://www.nlm.nih.gov/pubs/plan/lrp06/panel3report.doc>*

*Program Committee, 2005 IEEE International Conference on Computer Vision Workshop on Computer Vision in Biomedical Image Applications.*

*ABET Committee, Bioengineering Department, U. Pitt. 2005-present.*

*Graduate Curriculum Committee, Bioengineering Department, U. Pitt, 2003-2006.*

*Graduate Student Admission Committee, CMU Robotics Institute, 2004 – 2006.*

*Research Qualifier Committee, CMU Robotics Institute (David Choi, Chenyu Wu) 2004 - present*

*National Library of Medicine panel to review Requests for Quotations for, "Algorithms, Adapters, and Data Distribution for ITK," Washington, D.C., September 2004.*

*NIH Special Emphasis Panel to review U54 applications for "National Centers on Biomedical Excellence," Washington, D.C., May 2004.*

*Chair of Poster Session for Image Analysis at the 2004 International Symposium for Biomedical Imaging, Arlington, VA, April 2004.*

*MD/PhD Admissions Committee, University of Pittsburgh Medical Center, 2003-present.*

*Coordinator, Signals and Imaging Concentration, Dept. Bioengineering, U. Pitt, 1999-present.*

*Website Coordinator for Department of Bioengineering, U. Pitt. 2000-present.*

*Co-chair Medical Image Processing session (with Richard Robbs) at MICCAI 2003, Montreal, November 2003.*

*Organizer for Vision and Autonomous Systems Center. Carnegie Mellon Robotics Institute, Aug. 2003.*

*Hosted National Library of Medicine Insight Software Consortium, Pittsburgh, June 5-6, 2003.*

*Freshman Senior Design Project, Bioengineering, U. Pitt. (BioE 1160) Advisor for team project 2001*

*Freshman Engineering Conference (EGR 12), served as faculty co-chair for Medical Issues Session, Spring 2001.*

*Technology Review Committee, School of Engineering, U. Pitt, 2000-present*

*Freshman Curriculum Committee, School of Engineering, U. Pitt, 1999-present*

*Core Committee for Information Technology for Teaching and Learning at Duke, Reported to provost on technology in education at Duke, March - October 1997.*

*Duke - North Carolina NSF/ERC Ultrasound Workshop, chair, Visualization and Analysis Session, May 1995.*

*Visualization and Image Analysis Laboratory, Director, organized new facility in Duke School of Engineering, 1994-1995.*

*Chair, Distributed Mobile Data Bases, and Image Processing and Computer Vision sessions, Joint Conference on Information Sciences, Pinehurst, NC, November, 1994.*

*Visualization and Image Analysis (Seminar Series, Duke School of Engineering) weekly, April-June 1994.*

*Chair, Image Processing session, 2nd Annual international Conference on Fuzzy Theory and Technology, Durham,*

NC, October, 1993.

*Curriculum Survey Committee*, Chair of student committee, School of Medicine, SUNY Health Science Center at Syracuse; 1986-7.

#### **JOURNAL AND CONFERENCE REVIEWER:**

*IEEE Transactions on Medical Imaging*  
*IEEE Transactions on Biomedical Engineering*  
*Journal of Systems and Software*  
*Information Sciences*  
*Association for Computing Machinery SIGGRAPH*  
*International Conference on Computer Vision (ICCV)*

#### **ORAL PRESENTATIONS:**

*2nd Annual Bioimaging Day at CMU*, "Tracking and Identification of the Common Carotid Artery and the Internal Jugular Vein," April 12, 2006.

*Multidisciplinary Thyroid Cancer Conference, University of Pittsburgh Medical Center*, "The Sonic Flashlight: A new device to guide interventional procedures," Nov. 16, 2005.

*Johns Hopkins Center for Computer-Integrated Surgery*, "The Sonic Flashlight and Related Projects," Mar. 9, 2005.

*Robotics Institute Seminar*, "The Sonic Flashlight and Related Projects," Feb. 18, 2005.

*Robotics Institute 25<sup>th</sup> Anniversary, Robots and Thought - Robotics Seminar Marathon*, "The Sonic Flashlight - Enabling Image Guided Procedures." Carnegie Mellon University, Oct. 11, 2004

*Robotics Institute 25<sup>th</sup> Anniversary, Robots and Thought - Business Session*, "A Sonic Flashlight in Every Clinician's Pocket?" Carnegie Mellon University, Oct. 11, 2004

*National Library of Medicine, Board of Regents meeting*, Report on the Visible Human Project (Insight Toolkit, ITK), Washington, D.C., Sept. 21-22, 2004.

*U. Pittsburgh Summer Bioengineering Seminar Series*, "How to get an MD/PhD in 24 years." July 2, 2004.

*Demonstration of the Sonic Flashlight at the Legislative Reception of the Association of Engineering Colleges of Pennsylvania*, May 10, 2004, Capitol Rotunda, Harrisburg PA.

*Meeting of the NLM Insight Toolkit Consortium*, G. Stetten, D. Shelton, Y. Liu, J. August, C. Meltzer, J. Galeotti, S. Clanton, T. Cooper, L. Teverovskiy, P. Mitra, S. Allin, H. Shi, "ITK in Academic Research: A Project-Oriented Course for Graduate Students," National Library of Medicine, Washington, DC, Sept 22, 2003.

*Interview on Wired/CBS Radio Series*, G. Stetten, about the Sonic Flashlight, aired last week of July, 2003.

*Presentation to Deep Submersible Alvin Group*, G. Stetten, "Holographic Virtual Image Display," Woods Hole Oceanographic Institution, June 24, 2003.

*Meeting of the NLM Insight Toolkit Consortium*, G. Stetten, R. Tamburo, J. Galeotti, W. Chang, D. Shelton, and D. Sahn, "Real Time 3D Echocardiographic Data with Semi-Automated Boundary Tracking Algorithms," Philadelphia, PA, Feb 6, 2003.

*Meeting of the NLM Insight Toolkit Consortium*, D. Shelton, G. Stetten, J. August, and Y. Liu, "A Semester Course in ITK," Philadelphia, PA, Feb 6, 2003 (presented by Shelton).

*Meeting of the NLM Insight Toolkit Consortium*, J. Galeotti, L. Ibanez, G. Stetten, "A Draft Design for a Pair of Path Classes," Philadelphia, PA, Feb 6, 2003 (presented by Galeotti).

*Biomedical Imaging Research Opportunities Workshop*, "Progress Towards a Clinically Useful Sonic Flashlight," Washington, D.C., Jan. 31 2003.

*Meeting of the NLM Insight Toolkit Consortium*, G. Stetten, D. Shelton, A. Cois, R. Tamburo, W. Chang, "Summary of New Projects with the ITK Toolkit," Washington D.C., October 8, 2002.

George DeWitt Stetten, MD, PhD

- Whitaker Annual Conference*, "Working with Public Information Officers and Journalists," invited speaker, and workshop chair, August, 2002, La Jolla, CA.
- SIGGRAPH, 29<sup>th</sup> International Conference on Computer Graphics and Interactive Techniques*, "Ultrasound Visualization with the Sonic Flashlight," San Antonio, July, 2002. (by graduate students Damion Shelton, Wilson Chang, and Robert Tamburo).
- IEEE International Symposium on Biomedical Imaging 2002*, "Towards a clinically useful Sonic Flashlight," Washington D.C., July 7-10, 2002.
- Knowledge Showcase, University of Pittsburgh Medical Center*, "The Sonic Flashlight," (by graduate student Wilson Chang), June 23, 2002.
- Academy for Lifelong Learning: Seminar Series, CMU School of Computer Science*, "The Sonic Flashlight, the Telemetric Egg, and Deep Submersible Alvin," May 15, 2002.
- Center for Emerging Cardiovascular Technology Seminar, Duke University*, "Merging Ultrasound and Direct vision with Real Time Tomographic Reflection," April 1, 2002.
- Engineering Tissue Growth Conference, Pittsburgh PA*, "Sonic Flashlight Demonstration," March 20, 2002 (by graduate students Damion Shelton and Wilson Chang).
- Pittsburgh Tissue Engineering Initiative, Board of Directors Meeting*. "The Sonic Flashlight," February 7, 2002.
- Invited Speaker, Weekly Seminar, Siemens Corporate Research, Princeton, N.J.* "Real Time Tomographic Reflection and the Sonic Flashlight," November 29, 2001.
- Meeting of the NLM Insight Toolkit Consortium*, "Visualization and Analysis of 2D and 3D Ultrasound using the Insight Toolkit," November 8, 2001, Washington D.C.,
- IEEE and ACM International Symposium on Augmented Reality*, "Real Time Tomographic Reflection: Phantoms for Calibration and Biopsy," New York City, October 29-30, 2001.
- Medical Image Computing and Computer-Assisted Intervention – MICCAI*, "Magnified Real-Time Tomographic Reflection," poster, Utrecht, The Netherlands, October 2001.
- Faculty Lunch Speaker, CMU Robotics Institute*, "Real Time Tomographic Reflection – Progress to Date on the Sonic Flashlight," May 11, 2001.
- Invited speaker at DARPA seminar*, "In Vivo In Situ Display," DARPA Headquarters, Arlington, VA, April 18, 2001.
- Guest speaker for Bioengineering Seminar Course, Carnegie Mellon University (42-200)*, "Real Time Tomographic Reflection," April 5, 2001.
- Biomedical Engineering Seminar, Columbia University* "Automated Identification and Measurement of Cardiac Anatomy using Real Time 3D Ultrasound," March 30, 2001.
- Center For Orthopedics Research Seminar, Shadyside Hospital* "Real Time Tomographic Reflection with Ultrasound," Pittsburgh, January 1, 2001.
- Biomedical & Health Engineering Seminar, Carnegie Mellon University (BHE 42-200)*, "Real Time Tomographic Reflection with Ultrasound: Stationary and Hand-Held Implementations," November 10, 2000.
- University of Pittsburgh Dept. of Bioengineering Seminar*, "Tomographic Reflection to Merge Ultrasound Images with Direct Vision," October 27, 2000.
- Applied Imagery Pattern Recognition (AIPR) Workshop, 2000*, "Gradient Oriented Profiles for Unclassified Boundary Classification," R. Tamburo and G. Stetten, Cosmos Club, Washington D.C., October 17, 2000.
- Applied Imagery Pattern Recognition (AIPR) Workshop, 2000*, "System for Location-Merging Ultrasound Images with Human Vision," G. Stetten, V. Chib, R. Tamburo, Cosmos Club, Washington D.C., October 17, 2000.
- Medical Image Computing and Computer-Assisted Intervention – MICCAI 2000*, "Medial-Guided Fuzzy Segmentation," G. Stetten, S. Pizer, poster session, Pittsburgh, PA. , October 12, 2000.
- National Library of Medicine Insight Software Consortium, Core Developers Meeting*, "Java Standards Emulation

(JSE); a new internal GUI for C++," G. Stetten, V. Pitiyanuvath, R. Tamburo, A. Cois; National Library of Medicine, Washington D.C., June 22, 2000.

*National Library of Medicine Insight Software Consortium, Core Developers Meeting*, "Medial Morphogenesis of Shapes using Medial Node Models," G. Stetten, W. Portnoy, A. Cois, R. Tamburo; National Library of Medicine, Washington D.C., June 22, 2000.

*Vision and Autonomous Systems Center Seminar, CMU Robotics Institute*, "Fuzzy Medial-Based Segmentation using Truncated Wedges," May 8, 2000.

*National Library of Medicine Insight Software Consortium, Subcommittee Meeting on Validation Methodology*, "A Validation Technique for Fuzzy Segmentation," Columbia University, New York City, March 21, 2000.

*Carnegie Mellon Robotics Institute Seminar*, "Analysis and Visualization of Real Time 3D Ultrasound," October 25, 1999.

*XVIth International Conference on Information Processing in Medical Imaging (IPMI)*, "Automated Identification and Measurement of Objects via Populations of Medial Primitives, with Application to Real Time 3D Echocardiography," Budapest, Hungary, June, 1999

*William and Mary Univeristy, Faculty Candidate Lecture*, "Analysis and Visualization of Real Time 3D Ultrasound," April, 1999.

*Carnegie Mellon Robotics Institute, Faculty Candidate Lecture*, "Analysis and Visualization of Real Time 3D Ultrasound," April 8th, 1999.

*Michigan Technological University, Faculty Candidate Lecture*, "Analysis and Visualization of Real Time 3D Ultrasound," March 26, 1999.

*University of Toledo, Dept. of Bioengineering*, "Automated Identification and Measurement of Cardiac Anatomy in Real Time 3D Ultrasound Data," March 1999.

*Bucknell College of Engineering*, "Engineering: One Side of the Cutting Edge," March 5, 1999.

*American College of Cardiology 48th Scientific Sessions*, "Improved accuracy for a semi-automated method for computing right ventricle (RV) cavity volumes from Real Time3D Echo: Comparison studies to ultrasonic crystals in an open-chest animal model," March 1999.

*NHLBI, Echocardiology Seminar*, "Progress Towards Automated Identification of Cardiac Structures with Real Time 3D Ultrasound," N.I.H., Bethesda MD, December 8, 1998.

*Johns Hopkins U. Dept. Biomedical Engineering Seminar*, "Medial Properties of Shape for Identification and Measurement of Cardiac Structures in Real Time 3D Ultrasound," October 2, 1998.

*U. of Iowa Symposium on Cardiovascular Imaging*, "Engineering Aspects of 3D Ultrasound," September 25, 1998.

*Emerging Cardiovascular Technologies Seminar Series*, "Medial Properties of Shape for Identification and Measurement of Cardiac Structures in Real Time 3D Ultrasound," NSF ERC, Duke U., seen on inter-university network, June 24, 1998 (videotape available).

*Cleveland Clinic BME Departmental Lecture*, "Extracting Shape Properties in Real Time 3D Ultrasound Data," June 5, 1998.

*Curriculum Exposition*, "Education in the Next Millennium," panel speaker, Duke School for Children, April 26, 1998.

*Shaping Expectations: The Role of Technology in Science Education*, "Reality.java - How students learn by creating educational software," conference at Duke University, April 1998.

*Pathfinder Conference*, "Engineering education for a changing world," invited speaker, workshop on infrared networking in the classroom. Ohio Aerospace Institute, September 1995.

*EDUCOM Conference*, "Mobile Computing and the Paperless Classroom," San Antonio, panel speaker, October 1994.

*Training Program in Medical Informatics Seminar*, "The Duke Paperless Classroom," Duke University, transmitted on inter-university network, January 1994. (videotape available)

*Humanistic Lecture Series*, "Telemetry to help save an endangered species of birds," SUNY Health Science Center at Syracuse, February 1988.

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- C.A. Cois, K. Rockot, J. Galeotti, R. Tamburo, G. Stetten, "Shells and Spheres: A Framework for Variable Scale Statistical Image Analysis," CMU Robotics Tech Report #CMU-RI-TR-04-19, April, 19, 2006.
- D. Wang, W. Chang, G. Stetten, "Real-Time Ultrasound Image Analysis for the Insight Toolkit," special issue for MICCAI 2005 Workshop on Open-Source Software, published online in The Insight Journal, <http://hdl.handle.net/1926/43>
- D. Wang, R. Tamburo, G. Stetten, "Cumulative Gaussian Curve Fitter for Boundary Parameterization," special issue for MICCAI 2005 Workshop on Open-Source Software, published online in The Insight Journal, <http://hdl.handle.net/1926/45>
- G. Stetten, V. Chib, "Real Time Tomographic Reflection with Ultrasound: Stationary and Hand-Held Implementations," *Technical Report # CMU-RI-TR-00-28*, November 10, 2000. [http://www.ri.cmu.edu/pubs/pub\\_3412.html](http://www.ri.cmu.edu/pubs/pub_3412.html).
- M. Milazzo, G. Stetten, "Online Resources for the Blind, Tailoring the Web for the Blind and Visually Impaired," Whitaker Summer Research Program, Department of Bioengineering, U. Pitt., 2000. <http://www.pitt.edu/~orb/>
- W. Chang, G. Stetten, "A Novel Approach Analyzing Real-Time 3D CT Scans Using Core Atoms," Department of Bioengineering, U. Pitt. August 18, 2000.
- G. Stetten, "Volume of Arbitrary Shapes from Boundary Curvature and Medial Scale," *Technical Report # TR99-001*, Department of Computer Science, University of North Carolina at Chapel Hill, 1999.
- C. Merdes, G. Stetten, "Signed Distance to a Closed Surface Implied by a Stack of Freeman Chain Codes," Dept. Biomedical Engineering, Duke University, Durham, NC. 1999.
- G. Stetten, S. Pizer, "Automated Identification and Measurement of Objects via Populations of Medial Primitives, with Application to Real Time 3D Echocardiography," *Technical Report TR98-035*, University of North Carolina, Department of Computer Science, 1998.
- G. Stetten, S. Pizer, "Extracting Shape Properties via Populations of Medial Primitives," *Technical Report TR98-008*, University of North Carolina, Department of Computer Science, 1998.
- G. Stetten, G. Wang, V. Pitiyanuvath, "Reality.JAVA graphical simulation libraries, on-line documentation, source code, and examples," (<http://www.duke.edu/web/egr54>) 1998, also used Fall 2000, in CPS 108 at Duke University (<http://www.gewang.com/projects/reality/>).
- G. Stetten, G. Wang, V. Pitiyanuvath, "Reality.java - How students learn by creating educational software," Report for NSF Recognition Award for the Integration of Research and Education, Duke University, April 18, 1998 (<http://www.aas.duke.edu/research/raire/handouts/rj.html>)
- G. Stetten, K. Crawford, "Glutmaster: cross-platform graphics programming environment," C++ wrapper for the GLUT graphics environment, listed on [www.opengl.org](http://www.opengl.org) and used in the introductory computer graphics course CS248 at Stanford University. (<http://www.opengl.org/Documentation/GLUT.html> or [www.stetten.com](http://www.stetten.com)) 1997.
- G. Stetten, "Visualization of simulated contrast injection, motion, and dispersion, given flows vectors (measured or calculated), to facilitate visual interpretation of flow in medical images," *Duke University Invention Disclosure*, Duke File No. 1265, March 28, 1996.
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- G. Stetten, N. Szeverenyi, "MR radio-frequency safeguard system for research MR scanner," S.U.N.Y. Syracuse, Dept. Radiology, 1991.
- G. Stetten, A. Rosenbaum, "Microprocessor-based photographic bracketing system for radiological photography," S.U.N.Y. Syracuse, Dept. Radiology, 1991.

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- M. Landy, M.S., L. Manovich, G. Stetten, "EVE: Software for Visual Modeling," *NYU, Psychology, TR 88-12, 1988*
- G. Stetten, "Report on the new standard heard format, the Early Vision Emulation (EVE) Project, and an application of these new tools to a vision model of Andrew Watson." Courant Institute, NYU, 1986.
- G. Stetten, "Manchester encoded 16-channel data system for tape", electronic hardware for recording extracellular potentials from monkey locus caeruleus. NYU Dept. Biology, 1985.
- G. Stetten, "Two-point navigation algorithm," used in Deep Submersible Alvin navigation system, Woods Hole Oceanographic Institute, 1984.
- G. Stetten, "Floating point forth," mathematics routines for Deep Submersible Alvin navigation computer, 1984.
- G. Stetten, "Alvin/Atlantis data system," documentation of software for shipboard use, 1984.
- G. Stetten, "U.V.X. - the element of a network," communications node for multi-processor network in Deep Submersible Alvin, 1983.
- G. Stetten, "S.M.P.T.E. code reader," hardware and software to read time-code for Alvin/Argo video system, 1983.
- G. Stetten, "Overall view of Alvin system," design of 2nd generation five-computer network on board Deep Submersible Alvin, 1983.
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- G. Stetten, "Music keyboard interface," built for research on artificial intelligence in music improvisation, for Marvin Minsky, Ph.D., at M.I.T., 1979.
- G. Stetten, "Alternative graphical scoring for computer music," Musical score Visualization software in "C" under UNIX. M.I.T. Computer Music Studio, with Barry L. Vercoe, Ph.D, 1978.
- G. Stetten, "Blood volume meter," Instrumentation to calibrate Doppler blood-flow meter, Stanford University Biomedical Engineering Laboratory, 1975.
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- G. Stetten, "Chemical bond energy simulation for organic molecules," undergraduate project, Harvard University, 1973.
- G. Stetten, "Five-card draw poker with betting and bluff, in Basic," undergraduate project, Harvard University, 1972.