

Dr. LAURENCE G. HASSEBROOK
Professional Engineer
Blazie Professor of Electrical and Computer Engineering
Professor of Electrical and Computer Engineering

Highlights of curriculum vita

Current positions held at University of Kentucky

Professor of Electrical and Computer Engineering.

Blazie Professor of Electrical and Computer Engineering.

Assistant Director of Industrial Relations, Center for Visualization and Virtual Environments.

Publications: A total of 124 technical publications, including 22 Journal Papers, 6 refereed Conference Papers, 3 Book Chapters, 43 Conference Papers, 1 Patent, 2 Patents pending, 4 provisional patents, 2 Intellectual Property licenses, 2 Invention disclosures, 16 Oral Presentations with Abstracts Only, 5 Poster Presentations, 28 University of Kentucky Technical Reports, 6 IBM Technical Reports.

Funding: Funding exceeding \$5.4 million total. PI: 26 grants, \$2.3 million. Co-PI: 10 grants, \$3.1 million.

Research Areas: (1) 3-Dimensional Data Acquisition, (2) Automatic Pattern Recognition and Tracking, and (3) Stochastic Analysis.

Teaching: Average teaching evaluation since Fall 1990: 3.2/4.0. Average course rating since Fall 1990: 3.1/4.0. Courses taught include Signals and Systems I (EE421g), Electronics Circuits Laboratory (EE462g), Senior Design (EE499), Introduction to Communications (EE511), Digital Communications (EE512), Digital Signal Processing (EE630), Stochastic Systems (EE640).

Graduate Advising: Completed Degrees (7 Ph.D, 23 MS). Degrees in Progress (1 Phd, 1 MSEE).

University Service: Assistant Director of Industrial Relations, Center for Visualization and Virtual Environments (2007). Member of Visualization Center Director Hiring Committee (2006). EE499 Senior Design Coordinator (1997 to 2000). EE499 Committee chair on setting up IEEE parts store (1996).

Professional Service: Session chair for *IEEE SoutheastCON* (1999) and *Multiconference on Systemics, Cybernetics and Informatics* (2002). Received Professional Engineering License (1994, Kentucky). Engineering consultant for 11 different companies.

Awards: Wethington Award (2007) for research contribution to UofK. Blazie Professorship, (2007 through 2010), IEEE Senior Member.

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CAREER RESEARCH GOALS

I have established a solid research effort in the areas of signal/image processing and pattern recognition. This effort represents a balance between basic and applied research. The underlying philosophy of my research is to develop innovative ideas integrated into practical systems supported by theoretical bases and tested with comprehensive analysis techniques.

EDUCATION

Ph.D. E.C.E. Carnegie Mellon University, Electrical and Computer Engineering, 1990
M.S.E.E. Syracuse University, Electrical and Computer Engineering, GPA: 3.86/4.0, 1987
B.S.E.E. University of Nebraska in Lincoln, Electrical Engineering, GPA: 3.31/4.0, 1979

PROFESSIONAL EMPLOYMENT

UNIVERSITY EMPLOYMENT

1. **Professor of Electrical and Computer Engineering, University of Kentucky**, July 2008-present.
2. **Blazie Professor of Electrical and Computer Engineering, University of Kentucky**, July 2007-present.
3. **Assistant Director of Industrial Relations, Center for Visualization and Virtual Environments, University of Kentucky**, May 2007-present.
4. **Associate Professor of Electrical and Computer Engineering, University of Kentucky**, July 1996-2008.
5. **Assistant Professor of Electrical Engineering, University of Kentucky**, July 1990- June 1996.

CONSULTING EMPLOYMENT

1. **Consulting, Physical Optics Corporation**, "Optical Processing," 2007.
2. **Consulting, Gentle Giant Studios, Inc.**, "3-Dimensional Scanning," 2006.
3. **Consulting, FlashScan3D, Inc.**, "3-Dimensional Scanning," 2004-2005.

4. **Consulting, GECO Exploration Inc.**, "3-Dimensional Coal Pile Profiling," 2001-2002
5. **Consulting, Foot Balance Systems Plus (FBSP), Inc.**, "Structured Light Foot Scanning System," 2000-2002.
6. **Consulting, University of Louisville**, "Real-Time Adaptive Multi-Spot Laser Beam Steering System," Phase I, STTR/BMDO contract number F19628-99-C-0084.
7. **Consulting, Parker Seals, Inc.**, "Uni-Pack Vision System," 2000-2001.
8. **Consulting, CodeStream Technologies Corporation**, Richardson, Texas, "Optical Code Division Multiple Access Channel Analysis," 2000.
9. **Consulting, Plumbers Helper, Inc.**, "Acoustic analysis of underground water leaks," 1998.
10. **Consulting, Kentucky State Department of Revenue**, "Communication Systems," 1996.
11. **Consulting, IBM Burlington Vermont**, Educational Workshop, "Modulation and Coding for Information Storage Technology," 8-9-94 to 8-11-94.

GRADUATE EMPLOYMENT

1. **Research Assistant, Carnegie Mellon University**, 1987-June 1990. Research in the areas of optical pattern recognition. Dissertation title: **DESIGN OF DISTORTION-INVARIANT LINEAR PHASE RESPONSE CORRELATION FILTERS AND FILTER BANKS.**
2. **Teaching Assistant, Syracuse University**, 1984-1987. Classes taught include: ECE 391 (Electrical Engineering Laboratory I), ECE 392 (Electrical Engineering Laboratory II). Also performed research in the areas of optics and pattern recognition. Masters degree project title: **FRactal Surface Gradient Estimation Using Sine Section Structured Light Illumination.**

ENGINEERING EMPLOYMENT

1. **Senior Associate Engineer, IBM**, 1981-1984, summers 1985, 1986, 1987. Development in the areas of non-destructive testing automation and circuit line inspection automation. Projects completed include: fiber optic bit error rate analysis, automated inspection, motor control, template alignment, feature measurement, template comparisons, training and morphological transformation of substrate images, automation and design of visual inspection stations, and structured light illumination systems.
2. **Assistant Engineer, Lincoln Electric System Corp.**, 1980-1981. **Development and automation of load analysis system.** Coordinated sampling, developed organizational structure and developed software used to estimate load usage for Electric Rates determination.

GRANTS (PI: 26 grants for \$2.3 million. Co-PI: 10 grants for \$3.1 million)

1. "Phase II: Surface Scanning For Assembly Line Interference Analysis: High Performance Non-Contact Surround 3-Dimensional Surface Scanning Methodology," **Toyota Motor Manufacturing**, Erlanger, KY. PI: L. G. Hassebrook, Co-PI: Daniel Lau. \$199,780. 1 year duration. (PENDING).
2. "Miniature, Non-Contact Rolled Equivalent Fingerprint Collection Device," US Army Research Office, subcontract from FlashScan3D. PI: L. G. Hassebrook. \$199,721. 1 year duration. (ACTIVE).

3. "Rolled Equivalent, 3-D Fingerprint/Palm Print Scanner." Department of Homeland Security and the National Institute of Hometown Security. PI: L. G. Hassebrook, Co-PI: Daniel Lau, Co-PI:Tamer Inanc (UofL). \$988,511. 1.5 year duration. Start March 2009 (ACTIVE).
4. "Optical Intrusion Alarm for Defense of Critical Infrastructure Under Conditions of Fog, Smoke or Fire," National Institute of Hometown Security, subcontract from the University of Louisville. PI: Robert Cohn (UofL), CoPI: L. G. Hassebrook. \$205,281. 3 year duration. Start March 2009, (ACTIVE).
5. "3-Dimensional Surround Scanning and Surface Feature Tracking," Kentucky Science and Technology Corporation, PI: L. G. Hassebrook. April 1, 2008 through September 30, 2009. \$48,647 (ACTIVE)
6. "Single 3D Fingerprint Biometric Sensor, " Department of Homeland Security, BAA07-08, Biometric Detector, subcontract from FlashScan3D. PI: L. G. Hassebrook, Co-PI: Daniel Lau. \$83,881. March 3, 2008 through Sept. 2, 2008, (INACTIVE).
7. "UUV Surface-Based Capture and Deployment (U-SCAD)" **Michigan Aerospace Inc.**, July 23, 2007 through January 18, 2008, **Phase I Office of Naval Research STTR** subcontract. (PI) L. G. Hassebrook, (Co-PI) Daniel L. Lau. \$21,000. (INACTIVE).
8. "MicroMirror Device Development Tools" University of Kentucky **Major Equipment Grant**, March 1, 2007 through May 30, 2007. (PI) L. G. Hassebrook, (Co-PI) Daniel L. Lau. \$49,983 (INACTIVE)
9. "High Resolution Composite Pattern Proof of Concept" **3D Imaging LLC.**, January 15, 2007 through May 15, 2007. (PI) L. G. Hassebrook, (Co-PI) Daniel L. Lau. \$18,609. (INACTIVE).
10. "High Speed Infrared Imaging" **M2 Technologies**. August 10, 2006 through February 9,2008. PI: Daniel L. Lau, Co-PI: L.G. Hassebrook, Co-PI: Ruigang Yang, Co-PI: David Nister. \$922,000 (INACTIVE).
11. "High Performance 3-Dimensional Surface Scanning" **Michigan Aerospace Inc.**, July1, 2006 through June 30, 2007, Phase II NASA SBIR subcontract. (PI) L. G. Hassebrook, (Co-PI) Daniel L. Lau. \$50,000. (INACTIVE).
12. "Facial Expression 3-D Scanner" **Gentle Giant Studios, Inc.** May 22, 2006 through May 21, 2007. (PI) L. G. Hassebrook, (Co-PI) Daniel L. Lau. \$59,802. (INACTIVE).
13. "Real-Time, 3-D Finger and Palm-Print Scanner for Entry and Access Portal Security," **Department of Homeland Security** administered by National Institute of Hometown Security Contract: 06-202: **NIJ 2004-IJ-CX-K055**. January 1, 2006 through December 30, 2008. (PI) L. G. Hassebrook, UofK ECE, (Co-PI) Daniel L. Lau, UofK ECE, (Co-PI) Henry G. Dietz, UofK ECE, (Co-PI) Tamer Inanc, UofL EE, (Collaborating Business Concern) Paul Herber of FlashScan3D, Inc.. \$859,896. (ACTIVE).
14. "Active and Passive Range Sensor Fusion for Automated Surveillance and Face Recognition," **Department of Homeland Security** administered by National Institute of Hometown Security Contract: 05-346: **NIJ 2004-IJ-CX-K055**. February 15, 2005 through June 30, 2007. (PI) Daniel L. Lau, UofK ECE, (Co-PI) L. G. Hassebrook, UofK ECE, (Co-PI) Chris Jaynes, UofK CS, (Co-PI) Ruigang Yang, UofK CS, (Co-PI) Robert Cohn, UofL EE, (Co-PI) Robert Byrd, WKU CS. \$654,668. (INACTIVE).
15. "Wide-area Rapid Iris Image Capture with Pan-tilt-zoom Cameras," **Department of Homeland Security** administered by National Institute of Hometown Security. January 1, 2006 through December 30, 2007. (PI) Ruigang Yang, UofK Visualization Center, (Co-PI) L. G. Hassebrook, UofK ECE, Subcontract Western Kentucky University and Somerset Community College (Collaborating Business Concern) MSRCo, Inc.. \$731,827. (INACTIVE).

16. "High Speed Infrared Imaging System Prototype Development" **M2 Technologies**. 2005 through 2006. PI: Daniel L. Lau, Co-PI: L.G. Hassebrook, Co-PI: Ruigang Yang, Co-PI: David Nister. \$250,000 (INACTIVE).
17. "Hybrid-Range Sensing Camera for High Lateral and Depth Resolution Imaging" Proposal WKURF 596217-05/08. Extramural funding \$24,421. February 3, 2005 through January 30, 2006. Sponsor **NASA EPSCoR** administered by Western Kentucky University. PI: **L. G. Hassebrook** and Co-PI: Daniel Lau. (INACTIVE).
18. "Surface Scanning For Assembly Line Interference Analysis," **Toyota Motor Manufacturing**, Erlanger, KY. PI: L. G. Hassebrook, Co-PI: Daniel Lau, Co-PI: William Dieter. \$200,745. October 1, 2004 through September 30, 2005. (INACTIVE).
19. "Axial Three-Dimensional Imaging of Ear Canal," **Stevrin and Partners**, Kallinge, Sweden. PI: L. G. Hassebrook (UofK). \$18,000. August 23, 2004 through December 30, 2005. (INACTIVE).
20. "Three-Dimensional Data Conversion," **FlashScan3D, Inc.**, Irving, Texas. PI: L. G. Hassebrook (UofK). \$10,908. June 21, 2004 through May 30, 2006. (INACTIVE).
21. "Real-Time Range Sensing Video Camera for Human/Robot Interfacing," **NASA STTR Phase I**. Small Business Concern: 03-1-T5.02-9872 JSC **Boulder Non-Linear Systems**. Research Institution: University of Kentucky and Jet Propulsion Laboratory. PI: L. G. Hassebrook (UofK), Co-PI: Danual Lau (UofK), Co-PI: Jay Stockley (BNS) and Co-PI: Tien-Hsin Chao (JPL). \$100,000. January 15, 2004 through January 14, 2005. (INACTIVE).
22. "Active-Range Sensing Video Camera," University of Kentucky **Major Research Equipment Grant**. PI: D. L. Lau, Co-PI: L. G. Hassebrook, and Co-PI: K. Donohue. \$46,000, January 1, 2004 to February 15, 2004. (INACTIVE)
23. "Vision Processing System with Workstation," University of Kentucky **Major Research Equipment Grant**. PI: D. L. Lau, Co-PI: L. G. Hassebrook, and Co-PI: K. Donohue, \$46,000, January 1, 2003 to February 15, 2003. (INACTIVE)
24. "Real-Time Adaptive Multi-Spot Laser Beam Steering System (RAMS-LBS)" **Phase II, STTR** extramural funding \$177,680 and \$39,050 matching. Total STTR grant funding \$986,213. Sponsor: **Missile Defense Agency**, Contract: F19628-02-C-0083. Primary Company: **Boulder Non-linear Systems**, PI: Robert W. Cohn, Co-PI: L. G. Hassebrook, Industrial Partner: Mission Research Corporation. August 2002 through August 2005. (INACTIVE)
25. "Evaluation of Machine Vision Technologies for the Inspection of Light Diffusing Plastic Films" CRMS grant for \$74,230. Sponsor: **GE Structured Products Division**. PI: W. Young, Co-PI: L. G. Hassebrook, Co-PI: Yu Ming Zhang, Co-PI: Kozo Saito. December 23, 2002 through June 30, 2003. (INACTIVE).
26. "Real-Time 3D Video Acquisition For Head and Hand Tracking In Augmented Reality" Proposal N02R04 D. Extramural funding \$24,829 and \$43,258 matching. August 1, 2002 through February 20, 2004. Sponsor **NASA EPSCoR** through **Western Kentucky University**. PI: L. G. Hassebrook, Co-PI: Daniel Lau and Co-PI: Brent Seales. (INACTIVE).
27. "Image Quality Assessment for Human Perception of Printer Output," Year 2 Extramural funding \$40,000. January 1, 2002 through December 30, 2002. Sponsor: **Lexmark International**. PI: Kevin Donohue, Co-PI: L. G. Hassebrook. (INACTIVE)
28. "Image Quality Assessment for Human Perception of Printer Output," Extramural funding \$35,000. January 1, 2001 through December 30, 2001. Sponsor: **Lexmark International**. PI: Kevin Donohue, Co-PI: L. G. Hassebrook. (INACTIVE)

29. One year continuation to "Technology Base in Optical and Optoelectronic Correlators", Extramural funding \$27,605 with \$43,770 matching from UK. July 1, 2000 to June 30, 2001, from NASA EPSCoR. Sponsor: **NASA cooperative agreement NCC5-222** through **Western Kentucky University**. Cluster PI: Robert Cohn of University of Louisville, UK PI: L. G. Hassebrook. (INACTIVE)
30. Subcontract to L. G. Hassebrook \$14,633 from U.L. for spot pattern tracking. Source grant by J. Stockley (PI, Boulder Nonlinear Systems) and R. W. Cohn, "Spatial light modulator based subsystems for real-time pattern generation and multi-spot beam steering," **Phase I STTR, Ballistic Missile Defense Organization** thru Air Force Research Laboratory, F19628-99-C-0084, \$64,991. (20 October 1999 - 19 October 2000) (INACTIVE).
31. One year continuation to "Technology Base in Optical and Optoelectronic Correlators", Extramural funding \$24,297 with \$28,888 matching from UK. July 1, 1999 to June 30, 2000, from **NASA EPSCoR**. Sponsor: NASA cooperative agreement NCC5-222 through **Western Kentucky University**. Cluster PI: Robert Cohn of University of Louisville, UK PI: **L. G. Hassebrook**. (INACTIVE)
32. Two year extension to "Technology Base in Optical and Optoelectronic Correlators", Extramural funding \$69,962 over 2 years with \$89,494 matching from UK. July 1, 1997 to June 30, 1999, from **NASA EPSCoR**. Sponsor: NASA cooperative agreement NCC5-222 through **Western Kentucky University**. Cluster PI: Robert Cohn of University of Louisville, UK PI: L. G. Hassebrook. (INACTIVE)
33. "Topographical Analysis with Structured Light", Seed funding for \$6,600 for 1 RA for 6 months from the **Center for Manufacturing** Systems. July 1, 1996 through December 30, 1996. PI: L. G. Hassebrook. (INACTIVE)
34. "Technology Base in Optical and Optoelectronic Correlators", Extramural funding \$90,411 over 3 years of a total grant \$375,000 over 3 years. July 1, 1994 to June 30, 1997, from **NASA EPSCoR**. Sponsor: NASA cooperative agreement NCCW-60 through **Western Kentucky University**. Cluster PI: Robert Cohn of University of Louisville, UK PI: L. G. Hassebrook. (INACTIVE)
35. "Integrated Studies of Physiological Responses to Weightlessness and Hypotensive Challenges", Total grant \$300,000 over 3 years. Sponsor ID: **WKU 522611-95-02**, July 1, 1994 from **NASA EPSCoR**. Cluster PI: Charles F. Knapp. CO-I: L. G. Hassebrook. (INACTIVE)
36. "On-Line Measurement of Lip Angle and Flock Boundary for Extrusion Process," Extramural funding \$25,040 from **Standard Products Co.**, Lexington, Kentucky. May 1, 1995 through February 15, 1996. PI: L. G. Hassebrook. CO-PI: Richard Muse W. C. Marlowe. (INACTIVE)
37. "High Performance Incoherent Illumination System Analysis," Extramural funding \$28,761 from **KBD Inc.**, Erlanger, Kentucky. April 1, 1995 through March 31, 1996. PI: L. G. Hassebrook. CO-PIs: Janet Lumppp and Richard Muse. (INACTIVE)
38. "Measuring Device for Incoherent Illumination," Extramural funding \$2,000 from **KBD Inc.**, Erlanger, Kentucky. April 16, 1995 through May 30, 1995. PI: L. G. Hassebrook. CO-PIs: Janet Lumppp and Richard Muse. (INACTIVE)
39. "High Performance Incoherent Illumination Feasibility Study," Extramural funding \$4,000 from **KBD Inc.**, Erlanger, Kentucky. March 1, 1995 through April 15, 1995. PI: L. G. Hassebrook. CO-PIs: Janet Lumppp and Richard Muse. (INACTIVE)
40. "Structured Light Height Measurement, Test and Analysis of Print Head Urethane Surface with +/- 1.59 μ m Accuracy", Extramural funding \$13,129 from **IBMOORE Inc.** August 10, 1994 to January 23, 1995. PI: L. G. Hassebrook. CO-PIs: Richard Muse and Terry McIlvain. (INACTIVE)

41. "Automatic Circuit Board Inspection Using Complex Linear Morphology", Seed funding for \$6,000 for 1 RA for 1 year from the **Center of Robotics and Manufacturing Systems**. January 1, 1994 through December 30, 1994. PI: L. G. Hassebrook. (INACTIVE)
42. "Automatic Circuit Board Inspection Using Complex Linear Morphology", Seed funding for \$6,000 for 1 RA for 1 year from the **Center of Robotics and Manufacturing Systems**. January 1, 1993 through December 30, 1993. PI: L. G. Hassebrook. (INACTIVE)
43. Principle investigator for "Acoustical Spherical Array Prototype Omni-Directional Imaging System", Seed funding for \$10,500 for 1 RA for 1 year from the **Center of Robotics and Manufacturing Systems**. July 1, 1991 through June 30, 1992. PI: L.G. Hassebrook, CI's: H. Hejase, K. Donohue and J. Li. (INACTIVE)
44. Equipment Grant from **Harris Corporation**, "Acoustical Spherical Array Prototype Omni-Directional Real-Time Imaging System", Received October, 1992. The equipment is a Harris Night Hawk NH3804 High-Performance Super-Minicomputer System. \$356,200 where UK pays 2-year maintenance agreement of \$23,088. PI L. G. Hassebrook. CI's: H. Hejase, K. Donohue and J. Li. (INACTIVE)
45. "Straight Line Detection and Estimation in Manufacturing Systems", Seed funding for \$11,400 for 1 RA for 1 year from the **Center of Robotics and Manufacturing Systems**. July 1, 1992 through June 30, 1993, extended to August 1993. PI: Jian Li, CI: L. G. Hassebrook. (INACTIVE)

ADVISOR FOR DEGREES IN PROGRESS (1 PhD, 1 MSEE)

1. **PhD**, Charles J. Casey, Topic: 3-Dimensional Facial Feature and Expression Tracking, anticipated May 2010.
2. **MSEE**, Priyanka Chaudhary, Topic: Automatic Spheroid Detection and Characterization, anticipated August 2009.

ADVISOR FOR COMPLETED DEGREES PhD (7)

1. **Ph.D. EE**, Veera Ganesh Yalla, Title: "Optimal Phase Measuring Profilometry Techniques for Static and Dynamic 3-Dimensional Data Acquisition," November 2006.
2. **Ph.D. EE**, Wei Su, Title: "Axial Motion Stereo Vision and Structured Light Illumination for 3-Dimensional Acquisition of the Human Ear," September 26, 2006. Co-Advisor: Daniel L. Lau.
3. **Ph.D. EE**, Chun Guan, "Composite Pattern For Single Frame 3-D Acquisition," December 2004.
4. **Ph.D. EE**, Michael Earl Lhamon, "Implementation Theory of Distortion-Invariant Pattern Recognition for Optical and Digital Signal Processing Systems," February 1997.
5. **Ph.D. EE**, Mao Wang, "Active Image Registration and Recognition," May 1995. Committee chairman: Dr. Bruce Walcott.
6. **Ph.D. EE**, Mohammad Rhamati, "Intensity- and Distortion-Invariant Object Recognition and Complex Linear Morphology," September 1993. Committee chairman: Dr. Robert Heath.
7. **Ph.D. Biomedical Engineering**, Abhijit Patwardhan, "Comparison of the Spectral Characteristics of the Cardio Vascular Responses to Adaptive and LBNP during free and paced breathing," March 1992. Co-advisor with Dr. Charlie Knapp.

ADVISOR FOR COMPLETED DEGREES MS (23)

1. **MSEE**, Vikas Chandra Mehta, "Performance of Pan-Tilt Tracker Based on the Pin-Hole Lens Model", April 2009.
2. **MSEE**, Neelima Mandava, "Color Multiplexed Single Pattern Structured Light Illumination," December 2008.
3. **MSEE**, Akshay Pethe, "Super Resolution 3D Scanning," September 2008.
4. **MSEE**, Raja Kalyan Ram Cavaturu, "Motion Correction Structured Light using Pattern Interleaving Technique," September 2008.
5. **MSEE**, Charles J. Casey, "Structured Light Motion Capture," April 2008.
6. **MSEE**, Deepthi Boyanapally, "Merging of Fingerprint Scans Obtained from Multiple Cameras in 3D Fingerprint Scanner System," February 2008.
7. **MSEE**, Pratibha Gupta, "Graycode Composite Pattern Structured Light Illumination," February 2007.
8. **MSEE**, Delicia Woon, "Implementation of Three Dimensional Linear Phase Coefficient Composite Filter For Head Pose Estimation," May 2005.
9. **MSEE**, Veera Ganesh Yalla, "Multi-Frequency Phase Measuring Profilometry," October 2004.
10. **MSEE**, Jielin Li, "Camera Calibration and Noise Analysis Structured Light Illumination Active Range Finders," May 2000.
11. **MSEE**, Robert R. Duncan, "Reduced Ephemeris Tracking Algorithm for Inclined Geosynchronous Satellites," May 1999.
12. **MSEE**, W.J.Chimitt, "Overlap- and Rotation-Invariant Composite Correlation Filter Design for Registration," August 1998.
13. **MSEE**, Yong Zhang, "Bit Transition Detection with Composite Filter Banks for High Density Magnetic Recording Channels," June 1998.
14. **MSEE**, Gayatri Rallapalli, "Excimer Laser Fabrication of Diffractive Optics," August 1997, (Thesis) Co-advisor with Dr. Janet K. Lumpp.
15. **MSEE**, Raymond C. Daley, "Design, Implementation and Analysis of Structured Light Systems," June 1997.
16. **MSEE**, Jing Zhang, "DSP Implementation of Direct Sequence Spread Spectrum Using Shift-Invariant Operators," January 1997.
17. **MSEE**, James Phillips, "Determination of Biological Tissue Thickness Using Laser Triangulation," November 1993, (Thesis).
18. **MSEE**, Marvin Nicholson, "Software Implementation of Direct and Multipath Acoustical Measurements," November 1993, (Project).
19. **MSEE**, Feng Zhang, "Dynamic Vehicle Networks for Early Emergency Alert," August 1993, (Project). Co-advisor with Dr. Jian Li.
20. **MSEE**, Rajish Advani, "Analysis of Speech by Linear Prediction Techniques," August 1992, (Project).
21. **MSEE**, Mohit Bhushan, "Acoustic Spherical Array Prototype Omni-Directional Imaging System," June 1992, (Project).
22. **MSEE**, Harold Polus, "Improving the Accuracy and Repeatability of LCD Contrast Ratio Measures for Reliability and Quality Control," May 1992, (Project).
23. **MS BioMedical Engineering**, "Frequency Response Characteristics and Spectral Patterns of Arterial Pressure in Heart Paced Dogs," August 1991, (Thesis). Co-advisor with Dr. Charlie Knapp.

PUBLIC AND PROFESSIONAL SERVICE

STUDENT PROGRAMS

1. Sponsored a student funded by NSF Research Experiences for Undergraduates (REU) in Electrical & Computer Engineering at the University of Kentucky (PI: Ingrid St. Omer).
2. Implemented EE499 as a Capstone Design course (Spring 2005).
3. Originated and coordinated ECE Senior Design Day from Fall 2001 to Spring 2005.
4. Judging Chairperson and Special Awards Judge for the Optical Society of America at the 2002 *Intel International Science and Engineering Fair*, Louisville, Kentucky, May 14-16
5. Special Awards Judge for The International Society for Optical Engineering (SPIE) at the 2002 *Intel International Science and Engineering Fair*, Louisville, Kentucky, May 14-16
6. June 1994-May 1995: Mentoring High School student Atsumasa Tayake in 3-D data acquisition. Published the following technical report: Atsumasa Tayake, R. C. Daley and L. G. Hassebrook, "3-D Wire Frame Model Generation," *University of Kentucky EE Technical Report*, CSP-95-003, **95**(3), 1-10 (May 1995).

PROFESSIONAL ACTIVITIES

1. Co-Chair of session "Image and Multidimensional Signal Processing II," at the 6th *World Multiconference on Systemics, Cybernetics and Informatics*, Orlando, Florida, July 15, 2002.
2. Chair of session "Signal Processing," at the *IEEE SoutheastCON*, Lexington, Kentucky, March 26, 1999.
3. Received Professional Engineering License (1994, Kentucky).
4. Professional and technical society membership: Society of Photo-Instrumentation Engineers (SPIE), Optical Society of America (OSA), IEEE and Pattern Recognition Society.
5. Book and Paper Reviews for Applied Optics, Optics Letters, Optical Society of America A, Optical Engineering, Pattern Recognition Letters, Pattern Recognition, IEEE Transactions on Image Processing, IEEE Transactions on Biomedical Engineering. One Book review (August 1993): Principles of Communications, 4th Edition, by Ziemer and Tranter. Published by Houghton Mifflin.
6. Seminar Activities
 - Presentation, DARPA IXO/AFRL(SN) 3D Workshop, "Composite Pattern Projection for Real-Time 3D Video Acquisition," co-authored by Daniel Lau, May 23, 2002
 - **Seminar, University of Louisville**, "Structured Light 3-D Data Acquisition Techniques, Implementation and Analysis," invited honorarium, September 26, 1996.
 - **Seminar, University of Louisville**, "Distortion-Invariant Optical Pattern Recognition for 1-D, 2-D and 3-D Signals," invited honorarium, October 19, 1995.
 - **Seminar, University of Louisville**, "Distortion-Invariant Pattern Recognition with Optical Correlation," presented, November 8, 1994.

UNIVERSITY SERVICE

1. Assistant Director of Industrial Relations, Center for Visualization and Virtual Environments (2007).
2. Member of Visualization Center Director Hiring Committee (2006)

3. EE499 Senior Design Coordinator (1997 to 2000).
4. EE499 Committee chair on setting up IEEE parts store (1996).

AWARDS

1. Appointment: Blazie Professor of Electrical and Computer Engineering, (2007 through 2010).
2. Wethington Award, significant contribution to the University's extramural research funding, 2007.
3. IEEE Senior Member 2007.
4. Professional Engineer 1994.
5. Outstanding Technical Achievement Award, IBM 1984.
6. First Place Student Project, University of Nebraska in Lincoln Engineering Week, 1979.

PUBLICATIONS

SUMMARY

Summary publication count includes 3 book chapters, 28 refereed journal and conference manuscripts, 42 conference manuscripts, 16 oral presentations, 5 poster presentations, 1 patent, 2 patents pending, 2 licensing agreements, 4 provisional patents and 34 technical reports.

BOOK CHAPTER OR SECTION

1. C. J. Casey, L.G. Hassebrook and D. L. Lau, "Structured Light Illumination Methods for Continuous Motion Hand and Face-Computer Interaction," *Human-Computer Interaction, New Developments, International Journal of Advanced Robotic System*, edited by Kikuo Asai, published by In-Teh, Croatia branch of I-Tech Education and Publishing KG, Vienna, Austria, pp 297-308, (copyright 2008) ISBN 978-953-7619-14-5.
2. L.G. Hassebrook and Chun Guan, "Distortion", *Encyclopedia of Optical Engineering*, edited by R. G. Driggers, published by Marcel Dekker, Inc., New York., pp 428-434, (2003)
3. R. W. Cohn and L. G. Hassebrook, "Representations of Fully Complex Functions on Real-Time Spatial Light Modulators," *Optical Information Processing*, F. T. S. Yu and S. Jutamulia, eds. Cambridge U. Press, ISBN 0-521-46517-6 (1998)

JOURNAL PAPERS PUBLISHED (22)

1. Yongchang Wang, Daniel L. Lau and L. G. Hassebrook, "Fit-sphere unwrapping and performance analysis of 3D fingerprints," *Applied Optics*, Accepted 2009.
2. C. Guan, L. G. Hassebrook, D. L. Lau and Veeraganesh Yalla, "Improved composite-pattern structured-light profilometry by means of postprocessing," *Optical Engineering*, Vol. 47(9) pp.097203-1 through 097203-11, September 2008.
3. C. Guan, L. G. Hassebrook, D. L. Lau and Veeraganesh Yalla, "Near-Infrared Composite Pattern Projection for Continuous Motion Hand-Computer Interaction," *Real-Time Imaging in*

- Journal of Visual Communication and Image Representation*, Vol. **18**, pp 141-150 (December 2006).
4. Wei Su and L. G. Hassebrook, "Pose and position tracking with Super Image Vector Inner Products" *Applied Optics*, Vol. 45, No. 31, pp 8083-8091 (November 2006).
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1. L.G.Hassebrook, Mike Troy and Walter Lundby, "3-Dimensional Facial Expression Scanning," Information Technology and Communications , *Kentucky Innovation and Entrepreneurship Conference*, Louisville, Kentucky, April 7 (2009)
2. Department of Homeland Security visits UofK laboratory March 18th, 2008
3. Department of Homeland Security site visit March 11th, 2008: Presented full handscanner design and status of project
4. Department of Homeland Security site visit January 16th, 2008: Presented full handscanner design and status of project
5. CTC Conference November 14th, 2007: Presented full handscanner design.
6. Invited presentation: **L. G. Hassebrook***, "Real-Time, 3-D Finger- and Palm-Print Scanner For Entry and Access Portal Security," Moderator: Mr. Chris Aldridge, *Biometric Technology in the Department of Justice, Biometric Consortium Conference*, Baltimore, Maryland, September 12, (2007)
7. Panelists: **L. G. Hassebrook*** and Tamer Inanc*, "3-Dimensional Ridge Acquisition from Live Finger and Palm Surface Scans," Panel Discussion Moderator: Christopher Miles DOJ/National

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