

JOHN M. HUNT
Senior Hardware/Software Engineer
Instructor

OHSU
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Professional Interests

- Instrument design for scientific and medical research, electronic product development
- Design involving analog and digital electronics, computer hardware and software, optics
- Teaching, project management, patent expert witness

Education

MSEE Johns Hopkins University 1979
BA University of Pennsylvania 1971 Natural Science/Physics

Technical Societies, Honors

IEEE, Senior Member
Optical Society of America
Optical Society of America, Columbia Chapter, served as President, VP
2008 Teacher of the Year, OGI School of Science and Engineering at OHSU

Current Employment

Senior Research Engineer, Instructor
Oregon Health & Science University, School of Medicine, Department of Biomedical Engineering,
Beaverton, Oregon

2008 – present Biomedical Engineering, OHSU
2003 - 2008 Computer Science and Electrical Engineering, OGI / OHSU
1998 - 2003 Electrical and Computer Engineering, OGI - OHSU merger 2001
1990 - 1998 Electrical Engineering and Applied Physics, Oregon Graduate Institute
1980 - 1990 Applied Physics and Electrical Engineering, Oregon Graduate Center

My primary work at OHSU is hands-on design and fabrication of specialized equipment for research projects. Projects involve analog and digital electronics design, microcontroller and software development and optical design. I particularly enjoy analog design, optics and embedded processor design. My duties also include working with vendors and suppliers, task planning and scheduling, meeting time and budget constraints, presentations to clients, preparing papers and reports, supervising technicians. I enjoy working independently, as a team member or leading a project team. My activities have been organized as a University Shared Core Resource since 2008.

Project experience: instrumentation, electro-optics, production

- Design and production of a portable device for medical data logging with telemetry. PIC microcontrollers, Bluetooth wireless link. Responsible for electronics design, component and materials selection, miniaturization, firmware, mechanical design, prototypes, test protocols, pilot production. Supervised technicians and vendors for production runs (NIH, Intel).
- Laser Heterodyne Optical Tomography (imaging into scattering tissue or fog) HeNe and diode pumped YAG lasers, acousto-optic modulator, heterodyne detection (NIH).
- Raman Spectrometer: optics, argon ion laser, stepper motor, control electronics & software (NSF).
- Laser Assisted Joining of Wax Molds, CO2 laser, stepper motor linear stage (Precision Castparts).

- CO2 laser, heterodyne detection; pulsed CO2 laser, direct detection: Optical Remote Sensing of Atmospheric Winds. Helped develop innovative LIDAR methods including pseudorandom code phase modulation for path resolved crosswind detection. (Army Research Office).
- Design and production of 32 channel high speed drivers for state of the art laser diode arrays (RCA Sarnoff Labs, GE).
- Laser diodes, fiber optics: Remote Sensing of Turbulence using Optical Spatial Filtering (NSF).
- Optical detection and automatic classification of insects in flight: solar cell detector, innovative system design, low-noise preamp, wide dynamic range (NSF).
- Avionics and telemetry for autonomous control of small unmanned helicopter (DARPA).
- Telemetry of Columbia River Tidal Data via 10 mile radio modem links and internet. Challenging requirements for durability in the field, range and low power (Office of Naval Research).

Project management and teaching at OHSU/OGI

- I manage the OHSU Electronics and Instrumentation core resource which I initiated in 2008
- Managed the computer facilities group (2 - 3 staff) in the ECE Department including technical planning and budgeting, customer service, and personnel management (recruiting, staff development, mentoring, corrective action when needed).
- Computer facility initiatives, managed two projects (\$460k) on time and on budget.
- Setup and managed the focused ion beam lab and job shop for the ECE Department (FEI FIB instrument, supervised 1 engineer).
- As an OHSU faculty member, I train students and for many years taught a two-term graduate class sequence (EE550 Introduction to Electronics and Instrumentation, EE551 Advanced Electronics and Instrumentation) which I initiated and developed.

Prior Employment

6/79 - 10/80: Engineer II, Senior Engineer, Intel, Hillsboro, Oregon.

I helped develop new A/D and D/A boards which became a profitable part of the Intel product line for 15 years. My work involved analog, digital and microprocessor design, high level and assembly language programming, microcomputer development equipment, industrial fiber optic links. Formal class work at Intel in device physics, microcontrollers, digital signal processing, management.

1977 - 1979 Graduate Student, EE, applied optics, biomedical engineering courses, Johns Hopkins University, Baltimore, Md.

1977: Engineer, Instrumedix, Beaverton, Oregon. Design and production of commercial cardiac monitoring equipment.

1971 - 1977: Engineer, Oregon Research Institute, Eugene, Oregon.

Analog, digital and transducer design, spectrum analysis, optical measurement of pupil size.

Special Skills

- Analog and digital electronics design, PSpice circuit simulation
- Application of lasers/optics in instrument design
- Microprocessor design, computer interfacing, embedded controllers, wireless telemetry
- Software development: C, assembly language, MATLAB, PIC microcontrollers
UNIX, Linux, Solaris, Windows
- Project planning and management, staff supervision
- Presentations and training
- Excellent written and oral communication skills
- Experience as a patent expert witness for electronics and instrumentation

Publications and Patents

11 journal papers, 14 conference papers, co-inventor on 3 US patents

Patents

J. F. Holmes, F. Amzajerjian, J. Hunt, "Apparatus for Optical Remote Wind Sensing", U.S. Patent 5,123,730.

J. F. Holmes, J. Hunt, D. Draper, T. Cloninger, T. Mersereau, M. Hosler, "Laser Based System for Joining Wax Segments into a Pattern for Investment Casting", U.S. Patent 4,806,729.

S. Carr, J. Dalzell, J. F. Holmes, J. Hunt, "Home Energy Monitoring and Control System", U.S. Patent 4,644,320.

Selected Conference Papers

T. Hayes, J. Hunt, A. Adami, J. Kaye, "An Electronic Pillbox for Continuous Monitoring of Medication Adherence," International Conference of the IEEE Engineering in Medicine and Biology Society, New York, NY, August 30 - September 3, 2006.

J. Holmes, J. Hunt, S. Jacques, "Heterodyne Optical Coherent Tomography (HOCT) System," OSA Coherent Optical Technologies and Applications (COTA) Topical Meeting, Whistler, BC June 28-30, 2006.

A. Bogdanov, M. Carlsson, G. Harvey, J. Hunt, D. Kieburtz, R. van der Merve, E. Wan, "State-Dependent Riccati Equation Control of a Small Unmanned Helicopter," AIAA Guidance, Navigation and Control Conference, Austin, TX, 11-14 August, 2003.

J. Holmes, S. Jacques, and J. Hunt, "Adapting Atmospheric Lidar Techniques to Imaging Biological Tissue," BiOS 2000 International Biomedical Optics Symposium, San Jose, California, Jan. 22-28, 2000.

A. M. Baptista, M. Wilkin, P. Pearson, C. McCandlish, D. Jay, B. Beck, S. Das, J. Hunt, and P. Barrett, "Towards a Nowcast-Forecast System for the Columbia River Estuary," Fifth International Conference on Estuarine and Coastal Modeling, Alexandria, Va., Oct. 1997.

N. W. Carlson, G. A. Evans, D. P. Bour, R. Amantea, J. K. Butler, M. Lurie, J. M. Hammer, S. K. Liew, R. K. DeFreez, H. Ximen, J. M. Hunt, and R. A. Elliott, "An Experimental Study of the Operation of a Coherent Two-dimensional Grating-Surface-Emitting Ring Laser Array", Conference on Laser and Electro-Optics, Anaheim, California, May 21-25, 1990.

D. Draper, J. F. Holmes, J. Peacock and J. Hunt, "Techniques for Measuring Optical Phase Beyond Principal Values in the Atmosphere," Conference on Laser and Electro-Optics, Baltimore, Maryland, April 24-28, 1989.

D. Draper, T. Coninger, J. Hunt, and J. F. Holmes, "Laser Welding of Wax Patterns for Investment Casting," Proceedings of the American Foundrymen's Society Casting Congress, Hartford, Connecticut, April 25-29, 1988.

J. Hunt, J. F. Holmes, and F. Amzajerjian, "Optimum Local Oscillator Levels for Coherent Detection Using Photoconductors," Proceedings of the Optical Society of America Topical Meeting on Laser and Optical Remote Sensing, North Falmouth, Massachusetts, September 28 - October 1, 1987.

D. Draper, J. F. Holmes, J. Hunt and J. Peacock, "A Simple System for Frequency Locking Two CO₂ Lasers," Proceedings of the Optical Society of America Topical Meeting on Laser and Optical Remote Sensing, North Falmouth, Massachusetts, September 28- October 1, 1987.

J. F. Holmes, F. Amzajerjian, R. Gudimetla and J. Hunt, "Remote Sensing of Atmospheric Winds using a Coherent, CW Lidar and Speckle-Turbulence Interaction," Proceedings of the 13th International Laser Radar Conference, Toronto, Canada, August 11-15, 1986.

Selected Journal Publications

D. J. Bossert, R. K. DeFreez, H. Ximen, R. A. Elliott, J. M. Hunt, G. A. Wilson, J. Orloff, N.W. Carlson, G. A. Evans, M. Lurie, J. M. Hammer, S. L. Palfrey, and R. Amantea, "Grating Surface Emitting Lasers in a Ring Configuration," Appl. Phys. Lett., 56, 2068-2070, (1990).

R. K. DeFreez, H. Ximen, D. J. Bossert, J. M. Hunt, G. A. Wilson, R. A. Elliott, J. Orloff, G. A. Evans, N. W. Carlson, M. Lurie, J. M. Hammer, D. P. Bour, S. L. Palfrey, and R. Amantea, "Spectral Locking in an Extended Area Two-Dimensional Coherent Grating Surface Emitting Laser Array Fabricated Using Focused Ion Beam Micromachining", Photonics Technol. Lett., 2, 6-8, (1990).

D. Draper, J. F. Holmes, J. Hunt and J. Peacock, "A Simple System for Frequency Locking Two CO₂ Lasers," Applied Optics Letters 28, (1989).

J. Hunt, J. F. Holmes, and F. Amzajerjian, "Optimum Local Oscillator Levels for Coherent Detection Using Photoconductors," Applied Optics 27, 3135, (1988).

J. F. Holmes, F. Amzajerjian, R. Gudimetla and J. Hunt, "Remote Sensing of Atmospheric Winds by Utilizing Speckle-Turbulence Interaction, and CO₂ Laser and Optical Heterodyne Detection," Applied Optics 27, 2532, (1988).

D. Draper, T. Cloninger, J. Hunt, and J. F. Holmes, "Laser Welding of Wax Patterns," Modern Casting, 24, (October 1987).

J. F. Holmes, F. Amzajerjian, and J. Hunt "Improved Optical Local Oscillator Isolation Using Multiple Acousto-optic Modulators and Frequency Diversity," Optics Letters 12, 637, (1987).

J. Hunt, J. F. Holmes, S. Carr, J. Dalzell, "Electrical Energy Monitoring and Control System for the Home," IEEE Transactions on Consumer Electronics, CE-32, 578, (1986).

R. Elliott, H. DeXiu, R. DeFreez, J. Hunt and P. Rickman, "Picosecond Optical Pulse Generation by Impulse Train Current Modulation of a Semiconductor Laser," Appl. Phys. Lett. 42, 1012, (1983).