CURRICULUM VITAE

ALFRED D. DUCHARME

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EDUCATION

1994	Ph.D., Electrical Engineering	CREOL, University of Central Florida, Orlando, FL
1992	M.S., Electrical Engineering	CREOL, University of Central Florida, Orlando, FL
1990	B.S., Electrical Engineering	University of Massachusetts – Lowell, Lowell, MA

CAREER HIGHLIGHTS

- Built Hoverfly Technologies from kitchen table to $100M global supplier of Unmanned Aerial Vehicles.
- Developed world's first professional multi-rotor flight controller the HoverflyPRO and HoverflyGPS used by National Geographic Explorer Team and displayed in National Geographic Museum, Washington, DC.
- Invented high CRI color temperature changing solid-state white LED light bulb replacements now sold by Philips.
- Presented the Rudolph Kingslake Award by SPIE for most noteworthy article in *Optical Engineering*.
- Moved over 350 engineering courses online creating more online engineering content than any other institution. Expanded to entire University.
- Developed and licensed Solar Simulator technology for photovoltaic research.
- Part of original team that brought color changing light to the world as seen in every major city in the World. Used to illuminate the NBC Today Show studio as well as countless others.
- Inventor of 30 US and International patents.
- Taught over 10,000 engineering students how to "give ideas value."

RESEARCH INTERESTS

Optical Testing, Modulation Transfer Function, Laser Speckle, Diffractive Optics, Light Emitting Diodes, Solid-State Lighting, Embedded Control, and Robot Navigation and Control

TEACHING INTERESTS

Microcontrollers, Lasers Systems, Wave Optics, Fiber Optics, Electronics, Photonic Sensors, Colorimetry, Lighting, and Robotics

PROFESSIONAL AND ACADEMIC EXPERIENCE

9/15 to Pres. **Chief Technology Officer** – Hoverfly Technologies, Inc. Oviedo, FL
Responsible for management of all Research and Development projects, Technology Architecture, and Intellectual Property Management.

9/10 to 9/15 **President and CEO** – Hoverfly Technologies, Inc. Oviedo, FL
Founded an unmanned vehicle company to bring low altitude data collection using optical sensors to industrial customers around the world.

- Responsible for electronic design of all flight controller, motion controller, and UAV.
- Managed team of engineers through successful product design process for 20 products
- Filed for several patents protecting the core IP
- Established global distributer and reseller network
- Responsible for all business development
- Responsible for managing sales
- Managed contract manufacturing and internal manufacturing

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1/10 to 1/11 **Acting Chair** – Engineering Technology Department
University of Central Florida
- Managed 14 Professors, 2 staff
- Responsible for 800 students and 40 courses

5/09 to 9/15 **Associate Professor** – Engineering Technology Department
University of Central Florida
College of Engineering and Computer Science

7/06 to 9/15 **Assistant Dean** – Distance and Distributed Learning
University of Central Florida
College of Engineering and Computer Science
Responsible for College of Engineering and Computer Science Distance Learning programs, technologies and Course Management System. Management of 8 people, 30 classroom recording stations, and multi-media server and storage.
- Completely overhauled existing system
- Installed new Tegrity software based recording system
- Increased online content by 20% in the first year
- Increased efficiency of CMS
- Created new websites, training, and support materials
- Silver Award Winner - IMS Global Learning Consortium 2008 Learning Impact Award
- Student Achievement Award Winner 2008 – Tegrity, Inc.
- Campus Technology Award Nomination 2008

6/04 to 9/15 **Joint Appointment** – Assistant Professor
University of Central Florida
College of Optics and Photonics - CREOL

5/03 to 9/15 **Assistant Professor** – Engineering Technology Department
University of Central Florida
College of Engineering and Computer Science
Advisor and program coordinator for new BSEET-Photonics degree. Developed all associated courses included in the BSEET-Photonics degree.
- Introduction to Photonics Technology
- Laser Technology
- Wave Photonics
- Photonics Devices
- Photonic Manufacturing
- Photonics Simulation

2/02 to 5/03 **Visiting Professor** – Engineering Technology Department
University of Central Florida
College of Engineering and Computer Science
Conceptualized, designed, and received state approval for undergraduate program in Photonics Technology: BSEET-Photonics offered by Engineering Technology

12/00 to 1/02 **Principal Optical Engineer** – Engineering/Business Development
Color Kinetics Inc., Boston, MA
Served as the new technologies research specialist. Worked closely with Business Development to identify new opportunities for core technologies.
- Created new digital lighting network technology, DLC, and built technology demonstration.
- Organized and performed marketing research for DLC with over 40 customers.
- Realized DLC product and formed several OEM partnerships that have resulted in initial revenues of $100K with future potential of $10M/year.
- Idea-to-revenue in 6 months.
- Success is now changing strategic direction change for the company.

9/99 to 12/00 **Engineering Project Manager** – Engineering
Color Kinetics, Inc, Boston, MA
Maintained two roles. First, used my new product development experience to research

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and develop new products. Second, to establish a Photometrics Laboratory to measure the optical performance of lighting product lines.

- Developed consumer wearable lighting product.
- Designed non-imaging optical systems to improve efficacy.
- Used colorimetry and color space theory to develop new patentable technologies.

3/98 to 9/99 **New Product Development Manager**
Visidyne Inc., Burlington, MA
Led a team of engineers through the final development of three products based on Visidyne's core technology, optical phase measurement.

- *MicroRanger* – Time-of-Flight laser range finding system.
- *OpticalGPS* – Laser diode based position and orientation sensor system.
- *DMD Optical Fiber Measurement System* – System to measure differential mode delay in multi-mode optical fibers.

6/96 to 3/98 **Senior Scientist/Engineer** – Experimental Physics Group
Visidyne, Inc., Burlington, MA
Developed core technology, optical phase measurement, to 'turn-key' maturity. Successfully generated over $2.5M in SBIR commercial development funding.

- Developed core technology, optical phase measurement, to 'turn-key' maturity.
- Successfully generated over $2.5M in SBIR commercial development funding.
- Managed and participated on several SBIR Phase I and II programs.

2/95 to 6/96 **Principal Scientist/Engineer** – Aeropropulsion Technologies Group
Physical Sciences Inc., Andover, MA
Team Leader for Optical Metrology Group.
Wrote and won DOE Phase I SBIR proposal for the development of a system to project uniform illumination for the performance evaluation of photovoltaic cell.

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TEACHING

Curriculum Development

In 2002, the development of a new Photonics concentration was initiated by Dr. Ducharme. The Florida High-Tech Corridor Council (FHTCC) funded the research and development of a "2+2" photonics degree. This research effort involved discussions with the MetroEDC, FHTCC, Central Florida photonics industry leaders, community colleges, and K-12 administrators. Research showed that there was an immediate need for a "2+2" program in photonics degree both nationally and locally to support the growing number of photonics companies (approximately 100 in Central Florida in 2002).

In Spring 2003, a formal proposal for the new BSEET-Photonics degree was submitted and approved by the UCF University Policy and Curriculum Committee (UPCC). The degree and courses received approval from the State of Florida in Summer 2003. The first courses were taught as part of the BSEET-Photonics degree in Fall 2003.

Courses Developed and Taught

Courses developed and taught are in two main areas: Photonics and Electronics. Every established course taught required extensive work to bring each course up-to-date to include state-of-art the art technologies and methodologies. New courses were developed for the BSEET-Photonics degree. Many of these courses had never been taught at the required knowledge level and development could not be based on courses taught at other institutions. Few texts were even available for these courses and required development of level appropriate course companion note to be developed.

Electronics Courses

ETI 3651	Computer Applications	New Preparation
EET 3085	Electricity and Electronics	New Preparation
CET 3323	Digital Technology	New Preparation
CET 4134	Microprocessor Electronics II	New Preparation

Photonics Courses

EST 3222	Introduction to Photonics	Developed for BSEET – Photonics
EST 3213	Photonics Simulation	Developed for BSEET – Photonics
EST 3211	Wave Photonics	Developed for BSEET – Photonics
EST 4236	Laser Systems Technology	Developed for BSEET – Photonics
EST 4227	Photonics Sensors and Devices	Developed for BSEET – Photonics
EST 4256	Photonics Communications	Developed for BSEET – Photonics
EST 4259	Photonics Systems	Developed for BSEET – Photonics
ETM 4225	Manufacturing of Photonics	Developed for BSEET – Photonics

Other Courses

ETG 4950	Senior Design	New Preparation

Laboratories

CET 4134	Microprocessor Electronics II	New Preparation
EST 3211	Wave Photonics	Developed for BSEET – Photonics
EET 3085	Electricity and Electronics	New Preparation
CET 3323	Digital Technology	New Preparation
EST 4236	Lasers Systems Technology	Demonstration Lab

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RESEARCH, PUBLICATIONS AND OTHER SCHOLARLY ACTIVITIES

Research Grants and Proposal Submissions

Proposal submissions have been directed at two main areas: Education and Photonics. Education proposals were submitted to introduce equipment into the BSEET-Photonics and for Distance Learning technology studies and infrastructure development. Photonics submissions were in the areas of optical testing and Light Emitting Diode technologies and applications.

Total grant involvement (Internal and External):	**$3,945,040.13**
Total funding involvement (Internal and External):	**$660,996.00**
PI - Upconversion for High Efficiency-Solid State Lighting (ID: 1037295) Sponsor: US Department of Energy Submission Date: 2/2002 Status: Not funded	$40,000
PI - Research equipment for BSEET-Photonics Program (ID: 1039539) Sponsor: UCF/Presidential Equipment Initiative Submission Date: 9/2004 Status: Not Funded	$20,000
PI - Fiber Optic RF Link for JTRS & Systems Performance (ID: 1039676) Sponsor: Northrop Grumman Corporation Dates: 12/2003-12/2004 Status: Funded – Closed	$30,000
CoPI – Education Access, Achievement, …in Caribbean (ID: 1042016) Sponsor: US Department of Education-FIPSE Submission Date: 11/2004 Status: Not Funded	$432,113
PI - Support SWI in System Design, Analysis, Fabrication, and Test (ID: 1039947) Sponsor: Sensors World, Inc. Submission Date: 5/2005 Status: Not Funded	$300,000
PI - Infrared Test-Bed Software Development and Analysis (ID: 1042493) Sponsor: College of Optics and Photonics Submission Date: 2/2005 Status: Not Funded	$20,000
PI - High Power LED Fiber Optic Cable Illuminator (ID: 1040501) (PI) Sponsor: UCF/CREOL – FPCE Dates: 3/2004-3/2006 Status: Funded – Closed	$10,000
PI - LED Extraction Efficiency Improvement for Solid State Lighting (ID: 1042346) Sponsor: UCF/Office of Research and Commercialization Dates: 5/2005-12/2006 Status: Funded – Closed	$7,496
CoPI - Laboratory Components for a Photonics Program (ID: 1043867) Sponsor: National Science Foundation Submission Date: 1/2006 Status: Not Funded	$374,998
CoPI - iCLS: High-Quality Engineering Content Delivery System (ID: 1044304) Sponsor: National Science Foundation Submission Date: 5/2006 Status: Not Funded	$575,941
CoPI - A Study of Attitudes Towards Innovation in Engineering (ID: 1044904) Sponsor: National Science Foundation Submission Date: January 2006 Status: Not Funded	$1,484,439
PI – High-Power LED Fiber Optic Cable Illuminator: Year 2 (ID: 1042496)	$10,000

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Sponsor: College of Optics and Photonics
Dates: 3/2006-9/2007
Status: Funded - Closed

CoPI - Hybrid Motor High Powered Rocket Competition Proposal (ID: 1045652) $1,000
Sponsor: Florida Space Grant Consortium
Dates: 2/2007-5/2007
Status: Funded - Closed

PI - OP-TEC - RF: Ducharme Research Support (ID: 1046508) $12,500
Sponsor: National Science Foundation – OP-TEC
Dates: 8/2008-8/2012
Status: Funded – Continued funding for 4 years at ~$10k/year

CoPI - Young Entrepreneur and Scholar (YES) Scholarship (ID: 1046779) $615,000
Sponsor: National Science Foundation
Dates: 8/2008-8/2013
Status: Funded

Donations Acquired

Several donations have been solicited from a variety of private and public entities **totaling $60,000** for research and for the BSEET-Photonics degree.

Private Donation – Douglass J. Lattman	$10,000
Tegrity Inc., Multi-media distance learning server	$11,000
Zemax Inc., Zemax Raytrace software discount	$27,500
Alcon Inc., Test Lenses	$1,000
Microchip Inc., Development compiler software	$6,000
Parallax Inc., Speaking engagement (in-kind)	$1,000
Parallax Inc., Development hardware and software	$1,500
Micron Inc., Image sensor development hardware and software	$2000

Publications

Books

Ducharme, A., "Imaging System Performance for Reconnaissance," OP-TEC Modules on Photonics Series, Editor Sauders, J., CORD Publishing, Waco, TX (2007).

Ducharme, A., "Infrared Systems for Homeland Security," OP-TEC Modules on Photonics Series, Editor Sauders, J., CORD Publishing, Waco, TX (2007).

Ducharme, A., "Photonics Principles in Photovoltaic Cell Technology," OP-TEC Modules on Photonics Series, Editor Sauders, J., CORD Publishing, Waco, TX (2008).

Additional OP-TEC publications are scheduled for 2008-2010.

Refereed Journal Publications

Gammoh, D., Elshennawy, A., Ducharme, A., "Six sigma implementation on a distance learning application," J. of Management and Eng. Int., ACCEPTED (2008).

Ducharme, A., Temple, S., "Improved aperture for modulation transfer function measurement of detector arrays beyond the Nyquist frequency," Optical Engineering, Vol. 47(9), (2008)

Gammoh, D., Ducharme, A., Mehrabian, A., Elshennawy, A.,"Contribution of international students to engineering graduate schools in the United States," ASEE Annual Conf., AC2008-573, (2008).

Gammoh, D., Ducharme, A., Mehrabian, A., "Education of women in engineering graduate schools in Jordan: an empirical perspective," ASEE Annual Conf., AC2008-516, (2008).

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Gammoh, D., Ducharme, A., Mehrabian, A., "Performance analysis of software based video lecture capture and delivery system," ASEE Annual Conf., AC2008-604 (2008).

Gammoh, D., Elshennawy A., Ducharme D., "Social Impacts on the Enrollment of Women in Engineering Related Studies in Jordan", IAMOT Annual Conf., Paper ID: 1569086872 (2008).

Ducharme, A., "Microlens diffusers for efficient laser speckle generation," Optics Express, 15(22), pp. 14573-14579 (2007).

Amon, F., and Ducharme, A., "Image Frequency Analysis Techniques for Testing Fire Service Thermal Imaging Cameras", Fire Technology, submitted (2007).

Alfred Ducharme, "Development of an Electrical Engineering Technology Photonics Track," 2006 ASEE Annual Conf., 2006-674 (2006).

Worked in Industry from 1994-2003 (for published work during this time see Patents)

Alfred Ducharme, A. Daniels, E. Grann, G. Boreman, "Design of an integrating sphere as a uniform illumination source," IEEE Trans.s on Edu., vol. 40, pp. 131-134 (1997).

McManus, K., Ducharme, A., Goldey, C., Magill, J., "Pulsed jet actuators for suppressing flow separation," J. of AIAA, (1996).

Daniels, A., Boreman, G.D., Ducharme, A.,Sapir, E., "Random transparency targets for modulation transfer function measurement in the visible and infrared regions, " Opt. Eng., 34(3), pp. 860-868 (1995).

Ducharme, A., Boreman, G., Yang, S., "Elimination of threshold-induced distortion in the power spectrum of narrow-band laser speckle," Appl. Opt., 34(28), pp. 6538-6541, (1995).

Ducharme, A.D. , Boreman, G.D., "Holographic elements for modulation transfer function testing of detector arrays," Opt. Eng., 34(8), pp. 2455-2458 (1995).

Ducharme, A.D., Boreman, G.D., Snyder, D.R., "Effects of intensity thresholding on the power spectrum of laser speckle," Appl. Opt., 33(13), pp. 2715-2720 (1994).

Sensiper, M., Boreman, G., Ducharme, A., "Modulation transfer function testing of detector arrays using narrow-band laser speckle," Opt. Eng., 32(2), pp. 395-400 (1993).

Invited Papers

Ducharme, A., Gallagher, N., "Distance Education Technology: New model for lecture recording and distribution," J. of Internet Technology, 9(1), (2008).

Invited Presentations

Ducharme, A., Topping, R., "Lockheed Engineering Week: Hoverfly Technologies, Inc.," Lockheed Martin – Sandlake, 2019.

Ducharme, A., "Student perspective panel discussion," Tegrity User's Conf., June 2008.

Ducharme, A., "First year impressions of distance learning technology implementation," Tegrity User's Conf., June 2008.

Ducharme, A., "The big launch: implementing Tegrity at UCF", Tegrity User's Conf., June 2007.

Ducharme, A., Morgan, F., "Network control architecture," Proc. SPIE, vol. 4445, pp. 130-136 (2001).

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Markos, C., Ducharme, A., Wyntjes, G., "Ultra-high resolution two dimensional differential mode delay measurements of multimode fibers," NIST Symposium on Optical Fiber Measurements, pp. 131-134 (1998).

Invited Webinars

Ducharme, A., "Real-world strategies for driving student achievement," Campus Technology Magazine, Webinar, March 13, 2008.

Ducharme, A., Nayfeh, J., "How did UCF students instantly find answers to 50,000 class-related questions?," IMS Global learning Consortium, July 31, 2007.

Ducharme, A. "Learn how the University of Central Florida drove student achievement with innovative technology", Diversity Magazine

Conference Presentations

Ducharme, A., "Lecture capture at the University of Central Florida," Campus Technology Summer Conference (2008).

Ducharme, A., "The University of Central Florida: Improving student retention and satisfaction with class capture technology," Campus Technology Summer Conference, poster presentation (2008).

Ducharme, A., "Impressions of Tegrity Class Capture and Delivery System – Success at University of Central Florida," Sloan-C Int. Conf. on Online Learning, ACCEPTED (Nov. 2008).

Morse, L., Ducharme, A., "Lessons learned from going beyond chalk," ICEE, (July 2008).

Gammoh, D., Ducharme, A., Mehrabian, "Distance learning effectiveness: Launching Tegrity at the University of Central Florida," EISTA (2008).

Gammoh, D., Ducharme, A., "Social impacts of the education of women in engineering: A case study," IAMOT (2008).

Ducharme, A., "Improving student performance through class capture," IMS Global Learning Consortium, Annual Conference, (May 2008).

Ducharme, A., "Recent advances in the modulation transfer function testing of detector arrays," SPIE Symposium on Optical Engineering and Applications, 7060-28 (2008).

Gammoh, D., Ducharme, A., Mehrabian, A., Elshennawy, A.,"Contribution of international students to engineering graduate schools in the United States," ASEE Annual Conf., AC2008-573, (2008).

Gammoh, D., Ducharme, A., Mehrabian, A., "Education of women in engineering graduate schools in Jordan: an empirical perspective," ASEE Annual Conf., AC2008-516, (2008).

Gammoh, D., Ducharme, A., Mehrabian, A., "Performance analysis of software based video lecture capture and delivery system," ASEE Annual Conf., AC2008-604 (2008).

Gammoh, D., Elshennawy A., Ducharme D., "Social Impacts on the Enrollment of Women in Engineering Related Studies in Jordan", IAMOT Annual Conf., Paper ID: 1569086872 (2008).

Gammoh. D, Elshennawy A, Ducharme A, "Performance Analysis of a New Online Delivery System at the University of Central Florida", IEMS Annual Conf. (2008).

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Alfred Ducharme, “Development of an Electrical Engineering Technology Photonics Track,” 2006 ASEE Annual Conf., 2006-674.

Amon, F., and Ducharme, A., "Fourier Transform Techniques for Imaging Performance Evaluations of Thermal Imaging Cameras used by the Fire Service", 11th International Interflam Conference Proceedings, Interscience Communications, (2007).

Ducharme, A., Markos, C., Rieder, R., Wyntjes, G., “Remote electrically passive position transducer,” Proc. SPIE, vol. 3541, pp. 149-155 (1998).

Ducharme, A., Baum, P., Wyntjes, G., Shepherd, O., Markos, C., “Phase based optical metrology system for helmet tracking,” Proc. of SPIE, vol. 3362, pp. 229-234 (1998).

Ducharme, A., Wyntjes, G., Markos, C., Boreman, G., “Precision closed loop control of optical beam steering,” Proc. SPIE, vol. 3292, pp. 129-138 (1998).

A. Ducharme, R. Skrivanek, G. Wyntjes, O. Sheperd, , “Precision helmet tracking systems using optical technology,” Proceedings of NDIA, Design and Integration of Helmet Systems, December 1997.

Alexander, T., Boreman, G., Ducharme, A., Rapp, R., “Point-spread function and MTF characterization of the kinetic-kill-vehicle hardware-in-the loop simulation (KHILS) infrared-laser scene projector,” Proc. SPIE, vol. 1969, pp. 270-284 (1993).

Daniels, A., Boreman, G., Ducharme, A., “Random targets for modulation transfer function testing,” Proc. of SPIE, vol. 1969, pp. 184-192, (1993).

Sensiper, M., Boreman, G., Ducharme, A., Snyder, D., “Use of narrowband laser speckle for MTF characterization of CCDs,” Proc. of SPIE, vol. 1683, pp. 144-151, (1992).

White Papers and Manuals

Laboratory Instructions, CET 4134 Microprocessor Electronics II

Laboratory Instructions, EST 3211 Wave Photonics

Laboratory Instructions, EET 3085 Electricity and Electronics

Laboratory Instructions, CET 3323 Digital Technology

Ducharme, A., “Using random test patterns to evaluate MTF,” SinePatterns, Inc. (2003).

Video Media

Florida Photonics Cluster Marketing Video, Producer, 2004.

Teaching Online: Tegrity Instruction, 7 Videos for instructors, Editor, Narrator, and Producer, 2007.

College of Engineering and Computer Science, Marketing Video, Participant, 2008.

Video Syllabus and Course Instructions, ETG 4950 Senior Design, 2006.

Case Study Participation

Tegrity Inc., “Case study: University of Central Florida,” Tegrity Inc., (2008).

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Basex Inc., "Technologies to teach the thumb generation: Report on collaboration, education and the future," Basex Publishing (2008).

Patents

United States Patents

Year	Number	Title
2022	11,518,542	Landing structure for an unmanned aerial vehicle
2019	10,365,663	Tether orientation sensor for controlling the position of a tethered aircraft
2018	10,054,943	Control sys. for unmanned aerial vehicle utilizing parallel proc. architecture
2012	8,142,051	Systems and methods for converting illumination
2011	7,959,320	Methods and app. for gen. and modulating white light illumination conditions
2010	7,658,674	Wireless lighting control methods and apparatus
2010	7,572,028	Methods and app. for gen. and modulating white light illumination conditions
2009	7,520,634	Methods and apparatus for controlling a color temperature of lighting conditions
2008	7,387,405	Method and apparatus for generating prescribed spectrums of light
2008	7,350,936	Conventionally-shaped light bulbs employing white LEDs
2007	7,255,457	Methods and apparatus for generating and modulating illumination conditions
2007	7,242,152	Systems and methods of controlling light systems
2007	7,186,003	Light-emitting diode based products
2007	7,161,556	Systems and methods for programming illumination devices
2006	7,135,824	Systems and methods for controlling illumination sources
2006	7,132,785	Illumination system housing multiple LEDs and provided with conversion
2006	7,088,040	Light source using emitting particles to provide visible light
2006	7,064,498	Light-emitting diode based products
2006	7,014,336	Systems and methods for generating and modulating illumination conditions
2005	6,975,079	Systems and methods for controlling illumination sources
2005	6,956,500	Real-time residential energy monitor
2005	6,897,624	Packaged information systems
2003	6,608,453	Methods and apparatus for controlling devices in a networked lighting system
2000	6,100,540	Laser displacement measurement system
2000	6,049,297	Digital phase measuring system and method
1999	5,997,155	Integrating projection optic

International Patents

Year	Number	Title
2003	WO/2003/024269	Methods and apparatus for generating and modulating white light
2002	WO/2002/101702	Systems and methods of controlling light systems
2002	WO/2002/069306	Systems and methods for programming illumination devices
2002	WO/2002/045467	Information systems
2001	WO/2001/036864	Systems and methods for generating and modulating illumination
2001	WO/2001/082657	Light-emitting diode based
2000	WO/2000/050843	Laser displacement measurement system
2000	WO/2000/032018	Digital phase measuring system and method

Patent Disclosures Submitted to UCF

Ducharme, A., "Road Tone" (2006) – Rejected
Ducharme, A., "Upconversion Light Source", (2003) – Accepted (US 7,088,040)
Ducharme, A., "Beat per minute exercise synchronizer" (2006) - Rejected
Ducharme, A., "Smart mattress" (2008) - Pending

University Service

Administration

In 2006, Dr. Ducharme took an administrative role as Assistant Dean of Distance and Distributed Learning for the College of Engineering and Computer Science. The College was in need of a complete modernization of our Distance Education system. All existing equipment was dismantled and a new

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system called Tegrity was installed. Dr. Ducharme personally installed all new hardware and software and trained approximately 120 faculty on its use. The new system is being used to capture to video and distribute via the internet over 300 engineering undergraduate and graduate courses each year. The amount on available content has increased by approximately 20% in the first year of operation. The system is now additionally used for tutoring, symposium and ABETS related activities. Dr. Ducharme now oversees all online content including College websites, Tegrity, and Webcourses. This role includes the management of department budget, all purchasing decisions, 8 staff, and hardware and software.

Center Creation

As part of the effort to modernize the College of Engineering and Computer Science Distance Learning programs, Dr. Ducharme established the Center for Online and Virtual Education (COVE). The mission of this center is to research and implement new methodologies and technologies for delivering engineering education at a distance. In addition, COVE oversees all distance learning and online engineering educational resources and trains faculty on effective use of technology for education.

Faculty Advisor to Student Organization or Projects

- Conducted Independent Studies for 12 students on various research topics
- Supervised approximately 20 Senior Design teams for Engineering Technology Department
- Supervised 2 Senior Design teams for Electrical Engineering Department
- Faculty Advisor – Remote Control Hobbies Student Club (2005-Present)
- Faculty Advisor – ASET - American Society of Engineering Technology (2006)
- Faculty Advisor – SEDS - Students for the Exploration and Development of Space (2006-Present)

Academic Advisement

Academic advisement responsibilities include the following. These responsibilities were primarily students enrolled in the BSEET-Photonics program. However, advisement is not limited to this program but typically includes students from all engineering departments as well as other colleges.

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- Guidance for selecting proper course sequences to achieve educational goals in a timely manner
- Familiarizing students with University policies, rules, and environment.
- Assisting and advising students with their Senior Design projects.
- Advising students with registration and the Add/Drop/Withdraw processes.
- Counseling students with academic and personal hindrances
- Informing prospective and current students with employment opportunities
- Aiding students in studying practices.
- Participating in marketing and promotion of the BSEET-Photonics program
- Job placement, resume preparation and salary negotiation advise.
- Wrote numerous recommendations for ROTC, Scholarships, Graduate programs, and employment.

Speaker Invitations

Invited Chip Gracey Founder and CEO of Parallax, Inc. to speak to College of Engineering and Computer Science (CECS). Mr. Gracey gave a presentation to students and faculty of CECS and College of Business on engineering entrepreneurship entitled "Engineering Your Dream." The presentation was given on November 16, 2007.

Committee Service

UCRC University Course Review Committee (2005-2006)
LAC Library Advisory Committee (2004-2005)
College of Engineering and Computer Science Technology Committee (2006-Present)
ITRCC Information Technology Resources Coordinating Committee (2006-Present)
SSOC State Systems Operating Committee (2006-Present)
IAB Engineering Technology Advisory Board (2002-Present)
FHTCC Florida High-Tech Corridor Council (2004-Present)
FPC Florida Photonics Cluster Assistant Director (2004)
FPC Florida Photonics Cluster Non-Voting Member (2004-Present)
CECS Assessment Plan

Community College and Other Partnerships

Valencia Community College, Orlando, FL

Worked closely with VCC engineering faculty in the development of the BSEET-Photonics program. This "2+2" program enables students with an AS degree to articulate into the BSEET-Photonics degree at UCF to complete the final 2 years of their education in photonics.

Indian River Community College, Fort Pierce, FL

Aided in the design and outfitting of their new Photonics curriculum and Photonics Laboratory. This state-of-the-art laboratory resides in the 94,000 square foot Kight Center for Emerging Technologies established in 2006 on the IRCC main campus. Participated on several educational grant opportunities including the establishment of the OP-TEC: The National Center for Optics and Photonics Education. IRCC is now a College Partner of OP-TEC and one of the primary advisors to the center.

Professional Association Memberships and Reviewer Activities

Member of:

SPIE – International Society of Optical Engineers
ASEE – American Society for Engineering Education

Reviewed Journal Manuscripts for:

Applied Optics	OSA	Optical Society of America
Optical Engineering	SPIE	International Society of Optical Engineering
IEEE Transactions on Signal Processing	IEEE	Institute of Elec. and Electronics Eng.

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Conferences Attended

2002 to 2008	SPIE Aerosense
2004 & 2005	OSA Annual Conference
2004 to 2008	SPIE Photonics West
2004 to 2007	SPIE Photonics East
2004 to 2007	SPIE Annual Conference (2008 planned)
2005 to 2007	Educause Annual Meeting (2008 planned)
2006	ASEE Annual Conference (2008 planned)
2006 to 2007	SSOC Workshop Meeting (2008 planned)
2007	EDIN Workshop
2007	Tegrity Users Conference
2007	Sloan-C (2008 planned)
2008	Campus Technology Annual Meeting
2008	IMS Global Learning Consortium Annual Conference

Public School Service

Junior Science and Humanities Symposium

Invited speaker on photonics addressing 40 of the US's brightest science students from around the country. Hosted by NAVAIR, approximately 360 students competed for the opportunity to travel to Florida to hear from scientists in photonics, forensics, simulation and training, and nanotech.

Volusia County Science Mobile

Participated in proposal development for Volusia County Science Mobile. Helped to determine needed equipment and made recommendations on potential experiments.

Jacksonville Area High School Photonics Curriculum Development

Aided school officials and faculty on the development of Photonics related courses

Photonics Tech Camp

Photonics Tech Camp is a series of seminars that bring middle and high school teachers from around the state to Orlando for a two-day industry orientation. The intent of the program is to help educators understand photonics so that they are better able to incorporate the topic into their curriculums. By introducing students to photonics at an early age, there is a greater chance they will pursue the field in their secondary education. This is an on-going effort and Photonics Tech Camps are scheduled as needed by the Central Florida school Districts.

Dr. Ducharme was a primary participant in the 1 year effort to develop the Photonics Tech Camp in 2002 and 2003. He is one of the main presenters teaching "The World of Light" and "Photonics in our Daily Lives."

Orange County Gifted Student Summer Program

Taught "Holography" in the summer of 2004 to class of approximately 30 students. Dr. Ducharme is continually seeking opportunities for education outreach to Central Florida Public Schools. Dr. Ducharme founded the Center for Research and Education in Optics and Lasers (CREOL) Educational Outreach program in 1992. This effort continues today as "Optics Day" as well as programs organized by the student organization CAOS at CREOL.

Professional Service

Consulting

2010-2012	**International Society of Optical Engineers (SPIE)**, Bellingham, WA Online course content advisor.
2009-Pres.	**International Society of Optical Engineers (SPIE)**, Bellingham, WA Short Course Instructor for SC156 Basic Optics for Engineers and SC157 MTF in Optical and Electro-Optical Systems.
2008	**Enforcement Technologies**, Milwaukee, WI Developed 3 proposals for future consulting on hostage negotiation systems

2007 **BAE Systems**, Austin, TX
Taught 1 day course on Basic Optics

2007 **Nedisco**, Netherlands
Developed modulation transfer function target and test procedures. Measured several image sensors under development.

2007 **High Tech Photonics**, Orlando, FL
Designed and built timing generation controller for infrared spectrometer.

2006 **Cardio Optics**, Boulder, CO
Worked with engineers to measure modulation transfer function of fiber bundle cardiovascular endoscope.

2006 **Lockheed Martin**, Orlando, FL
Worked with engineers to develop JSF camera test procedures.

2006 **NIST**, Gaithersburg, MD
Designed test target for fire department microbolometer infrared cameras.

2006 **Orlando Buzzards**, Orlando, FL
Served as club Vice-President

2006 **Intevac**, Santa Clara, CA
Developed test target for image electro-optics system.

2006 **Academy of Motion Pictures Arts and Sciences (The Oscars),** Hollywood, CA
Worked with imaging specialists in the design and development of a test target for High-Definition Digital Film Motion Cameras.

2005 **Micron Technology**, Allen, TX
Developed imaging performance targets and test procedures for cell phone CMOS image sensor.

2005 **Stanford Linear Accelerator Center**, Menlo Park, CA
Designed innovative particle imaging sensor performance test.

2004 **Boeing**, Seatle, WA
Taught 2 day course on photonics and measurement of modulation transfer function.

2003 **Supervision, Inc.,** Orlando, FL
Designed and tested underwater LED light fixture.

2002 **M&M Systems** – Daytona Beach, FL
Developed innovative home power consumption meter resulting in US Patent #6,956,500.

1998-2015 **Applied Image Group**, Rochester, NY
On-going consulting to produce modulation transfer function testing targets.

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2002-2015 **Precision Optical Imaging**, Rochester, NY
On-going consulting to produce imaging performance targets.

2003 **Supervision, Inc.,** Orlando, FL
Designed and tested underwater LED light fixture.

2004 Boeing, Seatle, WA
Taught 2 day course on photonics and measurement of modulation transfer function.

2005 **Stanford Linear Accelerator Center**, Menlo Park, CA
Designed innovative particle imaging sensor performance test.

2005 **Micron Technology**, Allen, TX
Developed imaging performance targets and test procedures for cell phone CMOS image sensor.

2006 **Academy of Motion Pictures Arts and Sciences (The Oscars),** Hollywood, CA
Worked with imaging specialists in the design and development of a test target for High-Definition Digital Film Motion Cameras.

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Designed test target for fire department microbolometer infrared cameras.

2006 **Lockheed Martin**, Orlando, FL
Worked with engineers to develop JSF camera test procedures.

2006 **Cardio Optics**, Boulder, CO
Worked with engineers to measure modulation transfer function of fiber bundle cardiovascular endoscope.

2007 **Orlando Buzzards**, Orlando, FL
Served as club President

2007 **High Tech Photonics**, Orlando, FL
Designed and built infrared linear detector USB interface board.

2007 **High Tech Photonics**, Orlando, FL
Designed and built timing generation controller for infrared spectrometer.

2007 **Nedisco**, Netherlands
Developed modulation transfer function target and test procedures. Measured several image sensors under development.

2007 **BAE Systems**, Austin, TX
Taught 1 day course on Basic Optics

2008 **Enforcement Technologies**, Milwaukee, WI
Developed 3 proposals for future consulting on hostage negotiation systems

Professional Training

SPIE – Short Course Instructor

In 2004, the International Society of Optical Engineers (SPIE) invited Dr. Ducharme to join their list of internationally recognized list of short course instructors. These instructors teach continuing education, day long courses, on a diverse range of topics in the field of optics. Instructors are considered to be the most knowledgeable and well known researchers in their area of expertise.

Dr. Ducharme currently teaches the following Short Courses for SPIE at 4 major conferences each year. In addition, these courses have been taught at Boeing and BAE Systems as in-company courses.

SC156 – Basic Optics for Engineers

This course introduces each of the following basic areas of optics, from an engineering point of view: geometrical optics, image quality, flux transfer, sources, detectors, and lasers. Basic calculations and concepts are emphasized.

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SC157 – MTF in Optical and Electro-Optical Systems

Modulation transfer function (MTF)is used to specify the image quality achieved by an imaging system. It is useful in analysis of situations where several independent subsystems are combined. This course provides a background in the application of MTF techniques to performance specification, estimation and characterization of optical and electro-optical systems.

These courses are evaluated by the course attendees after completion. Dr. Ducharme has scored well above the Symposium average each time the courses have been taught. His courses have set new enrollment records for SPIE and preparations have begun to move these courses online as a result of his success.

Conference Steering Committees

Tegrity User's Conference, Orlando, FL – June 2008

Dr. Ducharme serves as one of 8 "Technology Champions" on the Tegrity User's Conference Steering Committee. Responsibilities include monthly meetings for 9 months before the conference to review presentation proposals, determine conference organization, and events. He is also presenting a student panel and a presentation on UCF's Distance Learning Technology.

Professional Partnerships

SPIE Online Education - Advisor

The International Society for Optical Engineers (SPIE) has approximately 800 continuing education short courses available at conferences both in the US and abroad. Discussions initiated by Dr. Ducharme in early 2007, has inspired SPIE to move the most popular short courses online. Dr. Ducharme has been instrumental in guiding them through this process both technologically and logistically. UCF will host short course instructors to capture their lectures and edit the content so that it can be viewed online. Dr. Ducharme's SC156 – Basic Optics for Engineers will be the first course available on the new SPIE Online website. In addition, discussions with the College of Optics and Photonics have begun to offer Certificate programs in conjunction with SPIE using the new SPIE Online website. Dr. Ducharme was appointed as the primary advisor for SPIE's Online Education in Summer 2008.

Industry Associations

Florida Photonics Cluster

The Florida Photonics Cluster (FPC) is an industry association with a mission of united photonics companies that reside along the High-Tech Corridor. Dr. Ducharme has worked with the FPC since starting at UCF in 2002 to revitalize this association. This included organizing events, meetings, discussions with industry leaders, and participating in conference events. In 2004, Dr. Ducharme served as Assistant Director helping to solicit membership in the association. The FPC is now directed by Alex Fong of Optronic Labs in Orlando, FL and Dr. Ducharme serves as a non-voting member of the FPC Advisory Board.

Awards

2008 Campus Technology Award Nomination
2008 Student Achievement Award – Tegrity User's Conference
2008 IMS Global Learning Consortium – Silver Learning Impact Award
2008 IMS Global Learning Consortium – "Best class capture solution"
1995 Rudolf Kingslake Award – "Most noteworthy article in *Optical Engineering*."
1991 SPIE Photo Contest (3rd prize)

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Media and NewsCitations

2002 Aline Mendelsohn, "Mission: search, enjoy; for players in this modern game of hide-and-seek, adventure is the big prize", May 21, 2002.
2003 CREOL Highlights – UCF Publication
"Focus on Alumni: Dr. Alfred Ducharme"
2007 Channel 6 News – Mike DeForest
"Technology News: iPod for Distance Learning"
2007 Channel 2 News
"Apple's Launch of the iPod – How will UCF utilize it for engineering lectures"
2007 Anne Eisenberg, "What did the professor say? Check your iPod", New York Times, December 9, 2007.
2007 "New software captures classroom lectures for iPods," iPod Observer, December 10, 2007.
2007 Anne Eisenberg, "After a lecture, students can play it again on their laptops," International Herald Tribune, December 9, 2007.
2007 Luis Zaragoza, "The new classroom; Florida's students re-opting more and more for the convenience of online courses," July 23, 2007.
2007 Tom Robinson, "It's more than lecture re-runs", The Greentree Gazette, July 2007
2007 "Tegrity web-based solution drives UCF FEEDS program", Educational Pathways, Vol. 6, Issue 6, June 18, 2007.
2007 "University of Central Florida rapidly deploys Tegrity Campus 2.0", Tegrity Press Release, July 5, 2007.
2007 Etan Horowitz, "The wait is over! Here's the scoop on the iPhone," Orlando Sentinel, June 29, 2007.
2008 Ann McClure, "Lecture Capture: A fresh look," University Business, April 2008.
2008 Jeffrey Young, "The lectures are recorded, so why go to class?" Chronicle of Higher Education, May 16, 2008.
2008 Jeffrey Young, "Short and Sweet: Technology Shrinks the Lecture" Chronicle of Higher Education, June 20, 2008.

References

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Dr. Alfred D. Ducharme Deposition History

Updated Feb. 2023

Case Number	Field	Client Description	Work Product	Law Firm	Year
Civil Action No. 3:09-CV-02495-GEB	LED Lighting	Patent Inventor/Owner	Declaration and Deposition	Shiells Law Firm P.C., 1201 Main Street - Suite 2470, Dallas, TX 75202 - 214-979-7200	2011
IPR2014-00935	LED Lighting	Patent InventorOwner	Declaration and Deposition	Shiells Law Firm P.C., 1201 Main Street - Suite 2470, Dallas, TX 75202 - 214-979-7200	2014
IPR2019-00343	Unmanned Aircraft	Petitioner	Declaration and Deposition	King and Spalding LLP - 1700 Pennsylvania Avenue, NW, Suite 200, Washington, D.D. 20006	2020
IPR(unassigned)	LED Lighting	Petitioner	Declaration and Deposition	Duane Morris LLP, 1075 Peachtree Street NE, Suite 2000	2021
Civil Action No. 6:19-cv-00059-RWS	LED Lighting	Patent Owner (Investment)	Declaration and Trial Testimony	Banie & Ishimoto LLP - 2100 Geng Road, Suite 210, Palo Alto, CA 94303	2021
6:19-CV-00059-RWS	LCD Monitor Control	Patent Owner (Investment)	Declaration and Trial Testimony	Banie & Ishimoto LLP - 2100 Geng Road, Suite 210, Palo Alto, CA 94303	2021
Case No.: 0:20-cv-62302-MOORE/SNOW	LED Lighting	Defendant	Declaration and Deposition	Akerman - 777 South Flagler Drive, West Palm Beach, FL 33401	2021
IPR2020-01638	LED Lighting	Petitioner	Declaration and Deposition	Duane Morris LLP, 1075 Peachtree Street NE, Suite 2000	2021
CaseNo.:6:19-CV-00059	LCD Monitor Control	Patent Owner (Investment)	Trial Testimony	Banie & Ishimoto LLP - 2100 Geng Road, Suite 210, Palo Alto, CA 94303	2022
IPR2021-01368	LED Lighting	Patent Inventor/Owner	Declaration and Deposition	Carmichael IP, LLC, 8000 Towers Crescent Drive, 13th Floor, Tysons, VA 22182	2022
IPR2022-00098	LED Lighting	Patent Inventor/Owner	Declaration and Deposition	Carmichael IP, LLC, 8000 Towers Crescent Drive, 13th Floor, Tysons, VA 22182	2022
IPR2022-00149	LED Lighting	Patent Inventor/Owner	Declaration and Deposition	Carmichael IP, LLC, 8000 Towers Crescent Drive, 13th Floor, Tysons, VA 22182	2022
IPR2022-00569	LED Lighting	Petitioner	Declaration and Deposition	Brooks Kushman, 1140 3rd Street NE, Washington, D.C.	2023
IPR2022-00534	LED Lighting	Petitioner	Declaration and Deposition	Brooks Kushman, 1140 3rd Street NE, Washington, D.C.	2023