

# ALFRED D. DUCHARME

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## EDUCATION

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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

- 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."

## EXPERIENCE

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9/15 to Pres.	<b>Chief Technology Officer</b> – 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	<b>President and CEO</b> – 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. <ul style="list-style-type: none"><li>♦ Responsible for electronic design of all flight controller, motion controller, and UAV products.</li><li>♦ Managed team of engineers through successful product design process for 20 products</li><li>♦ Filed for several patents protecting the core IP</li><li>♦ Established global distributor and reseller network</li><li>♦ Responsible for all business development</li><li>♦ Responsible for managing sales</li><li>♦ Managed contract manufacturing and internal manufacturing</li></ul>
1/10 to 1/11	<b>Acting Chair</b> – Engineering Technology Department University of Central Florida <ul style="list-style-type: none"><li>♦ Managed 14 Professors, 2 staff</li><li>♦ Responsible for 800 students and 40 courses</li></ul> College of Engineering and Computer Science
5/09 to 10/13	<b>Associate Professor</b> – Engineering Technology Department University of Central Florida <ul style="list-style-type: none"><li>♦ Introduction to the Engineering Profession I &amp; II</li><li>♦ Technology Entrepreneurship</li></ul> College of Engineering and Computer Science
7/06 to 10/13	<b>Assistant Dean</b> – 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. <ul style="list-style-type: none"><li>♦ Completely overhauled existing system</li><li>♦ Installed new Tegrity software based recording system</li></ul>

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- ◆ 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 6/09 **Joint Appointment** – Assistant Professor  
University of Central Florida  
College of Optics and Photonics – CREOL
- 5/03 to 5/09 **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 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.

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- 2/95 to 6/96 ♦ Managed and participated on several SBIR Phase I and II programs.  
**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 cells.
- ♦ Wrote and won DOE Phase I SBIR proposal for the development of a system to project uniform illumination for the performance evaluation of photovoltaic cells.

## CONSULTING

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- 4/14 to 11/16 **Expert Witness** – Case is concerned with patent infringement of RGB LED novelty garden products.
- 6/12 to 12/12 **Expert Witness** – Case was concerned with patent infringement of RGB LED novelty garden products.
- 2010-2012 **International Society of Optical Engineers (SPIE)**, Bellingham, WA  
 Online course content advisor.
- 2009-2012 **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**, Seattle, 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.
- 2002 **Precision Optical Imaging**, Rochester, NY  
 On-going consulting to produce imaging performance targets.
- 1998 **Applied Image Group**, Rochester, NY  
 On-going consulting to produce modulation transfer function testing targets.

## PATENTS

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<u>Year</u>	<u>Number</u>	<u>Title</u>
2018	10054943	Control sys. for unmanned aerial vehicle utilizing parallel proc. architecture
2013	14/247,974	<b>Pending:</b> Power and data trans. over thin conductor for unmanned aerial vehicle
2012	20130321656	<b>Pending:</b> Wireless network connected camera positioning system
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***

<u>Year</u>	<u>Number</u>	<u>Title</u>
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

## **PUBLICATIONS & SERVICE**

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Numerous technical publications in *Opt. Eng.*, *Appl. Opt.*, *IEEE*, and *ASEE*. List can be supplied if requested.

### **Reviewed Journal Manuscripts**

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.

### **Professional Association Memberships and Reviewer Activities**

SPIE – International Society of Optical Engineers

ASEE – American Society for Engineering Education

## **AWARDS**

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2012	Seminole County Economic Development – Best New Business
2011	Product Development Conference – Best New Technology
1995	Rudolf Kingslake Award – “Most noteworthy article in <i>Optical Engineering</i> .”
1991	SPIE Photo Contest (3 <sup>rd</sup> prize)