## David P. Larson


**Contact Information**

Ph.D. Student
Department of Mechanical and Aerospace Engineering
University of California, San Diego
9500 Gilman Drive
La Jolla, CA 92093-0411
dplarson@ucsd.edu


**Research Interests**

Evolutionary Methods, Genetic Algorithms, Shape Optimization, Bio-inspiration, Fluid Mechanics of biological locomotion, Fractional and Variable Order Methods

**Education**

**University of California, San Diego**, La Jolla, CA

Ph.D., Mechanical and Aerospace Engineering, June 2012–present

- Adviser: Professor Carlos F.M. Coimbra
- Area of Study: Fluid Mechanics

**University of California, Merced**, Merced, CA

B.S., Mechanical Engineering, August 2008–May 2012

- Fluid Mechanics specialization

**Research Experience**

Graduate Student Research — 2012–present

- Lab: Coimbra Group
- Location: University of California, San Diego
- Investigating the application of Fractional and Variable Order Methods to Nonlinear Chaos Dynamics

Visiting UC LEADS Scholar — Summer 2011

- Lab: Animal Flight Lab
- Location: University of California, Berkeley
- Host Program: Cal NERDS
- Investigated effects of turbulent air flow on hummingbird kinematics and metabolism
- Developed Particle Image Velocimetry (PIV) data analysis scripts for turbulent air flows

UC LEADS Scholar — Summer 2010

- Lab: Coimbra Group
- Location: University of California, Merced
- Investigated aerodynamic trends of flapping flight

Lab Manager 2010–2012

- Lab: Coimbra Group
- Location: University of California, Merced
- Oversaw research lab safety
- Managed group computer network and servers
- Trained group members on proper lab equipment use

Undergraduate Student Researcher 2009–2012

- Lab: Coimbra Group
- Location: University of California, Merced
- Deployed high-fidelity irradiance and weather instrumentation across California and Washington
- Tested long term degradation of anti-dust glass coating for solar panels
- Analyzed animal flight data to determine underlying aerodynamic trends-something

Undergraduate Student Researcher 2008–2009

- Hirst Group
- Location: University of California, Merced
- Investiaged phase separation in lipid tubules

Lab assistant 2007–2008

- Lab: MEMS Lab
- Location: University of California, Santa Cruz
- Developed prototype printable RF-ID tag for tracking of dragonflies
- Trained undergraduates to continue printable RF-ID tag research

## Professional Memberships

American Society of Mechanical Engineers (ASME), Member, 2009–present

Engineers for a Sustainable World (ESW), Member, 2011–present

## Hardware and Software Skills

Computer Programming:

- Matlab, Mathematica, Python, PHP, MySQL, Unix shell scripting, Ruby

Version Control and Software Configuration Management:

- Distributed Revision Control Systems (Git)

Matlab skill set:

- Linear algebra, Fourier transforms, Monte Carlo analysis, nonlinear numerical methods, polynomials, statistics, $N$-dimensional filters, visualization
- Toolboxes: genetic algorithm and direct search, signal processing, system identification

Computer Aided Design (CAD):

- Pro/ENGINEER, Autodesk Inventor

Multi-Physics Simulations:

- Pro/ENGINEER Mechanica, COMSOL, Autodesk Multiphysics Simulation

Prototyping Tools

- Computer Numerical Control (CNC) and manual mill, lathe, and drill press machining
- 3D printing using a ZCorp ZPrinter 650

Irradiance and Weather Instrumentation:

- Yankee Environmental Systems (YES) Multi-Filter Rotating Shadowband (MFR-7) and Total Sky Image (TSI-880)
- Eppley Laboratory Precision Spectral Pyranometer (PSP), Normal Incidence Pyrheliometer (NIP), Precision Infrared Radiometer (PIR), Total Ultraviolet Radiometer (TUVR), and Automatic Solar Tracker (SMT-3)
- Campbell Scientific CR1000 Data Logger
- Irradiance, Inc. Rotating Shadowband Radionometer (RSR2)
- Vaisala Weather Transmitter (WXT520)

Particle Image Velocimetry:

- LaVision DaVis image software, high speed cameras, q-switched lasers, wind tunnels

Information/Internet Technology:

- Networking (UDP, TCP), Services (Apache, SQL, POP, IMAP, SMTP)

Productivity Applications:

- TEX (LATEX, BIBTEX), Vim, most common productivity packages (for Mac OS X, Windows, and Linux platforms)

Operating Systems:

- Mac OS X, Windows, Linux

## Awards

**Innovate to Grow Competition** — May 2012

- 1st Place (tied) People's Choice
- Entry Title: Harvesting Energy from Irrigation Canals
- Team Members: David Larson, Daniel Leong, Steven Fleming, Samuel Isaiah

**Distributed Power Generation Project** — 2011

- Sponsors: ESW, SunEdison/MEMC, Autodesk
- Entry Title: Solar Powered Cargo Ship
- Funding Amount: $8150

**CITRIS Big Idea Competition** — Apr 2010

- Honorable Mention
- Entry Title: Distributed Computing for Open Access Solar Forecasting
- Award Amount: $1000

ASME Old Guard Oral Presentation Competition Apr 2012

- 5th Place, District D
- Entry Title: Distributed Computing for Open Access Solar Forecasting

University of California, Merced

- Dean's Undergraduate Research Scholar, 2008–2009
- 2nd Place Service Learning Final Presentation, Dec 2009
- 1st Place Service Learning Final Presentation, May 2009
- 1st Place Service Learning Final Presentation, Dec 2008