

Dwane A. Paulsen
Mechanical Engineering / Research Engineering / Technical Consultation
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Skills

- Automation / Controls
- Flow Sensor / Instrument Design
- Fluid Flow Analysis / CFD
- Heat Transfer Analysis / FEA
- IMRAD writing structure
- Mechanical Engineering / CAE
- PIC / PID Controllers
- Process Control / Optimization
- Simulation / Modeling
- SOP for quality assurance
- Spectrometry – Light / Mass
- Systems Engineering
- Testing / Test design

Programming Languages

- Fortran
- Labview
- Matlab
- Visual Basic

Selected Software

- ANSYS CFD
- Autodesk ALGOR (FEA)
- COMSOL Multiphysics
- Engineering Equation Solver (EES)
- FLUENT / GAMBIT (CFD)
- Latex Typesetting
- Microsoft Access, Excel, PowerPoint, and Word
- Microsoft Visio
- Origin
- Solidworks
- Wavemetrics' Igor Pro

Education:

University of Minnesota

Master of Science, Mechanical Engineering

1999-2001

Bachelor of Science, Engineering with Distinction

1994-1999

Work Experience:

MechSciTech LLC, Portland, OR

Aug 2010 to present

Founder / Owner

- Started a small business which provides engineering simulation services.
- Support clients with cutting-edge engineering simulation and technical consultation.
- Responsible for project proposal and report writing.
- Recent projects include a fluidized bed reactor, heat sink design, transient thermal analysis, pharmaceutical freeze-dryer design, free-vortex flow, and a natural convection-cooled gymnasium.

CH2M Hill, Portland, OR

Jun 2009 to Jul 2010

Mechanical Engineer / Technical Specialist

- CFD analysis of power plant exhaust ducts for mercury sorbent injection optimization.
- Investigated mercury sorbent break-up issues and quickly developed solutions.
- External flow analysis of manufacturing facility exhaust transport and dispersion.
- Developed testing protocols for high-tech data centers.
- Responsible for bringing current simulation team up-to-date with the latest fluid flow simulation procedures and software.

Portland Community College, Portland, OR

Winter 2010

Part-time Instructor – Manufacturing Processes

- Responsible for course curriculum development and teaching of course material.
- Developed and graded tests and homework.
- Arranged five class tours of local manufacturing facilities.

Physical Sciences Inc., Andover, MA

Jan 2007 to Jul 2008

Principal Engineer / Scientist

- Engineered flow-control systems for gas sensors and bio-aerosol particle instrumentation.
- Developed a bio-aerosol trigger for the U.S. Department of Homeland Security (DHS) using spark-induced breakdown spectroscopy (SIBS).
- Designed aerosol generators and characterized aerosol particle concentrators and sampling inlets.
- Performed simulations using Computational Fluid Dynamics (CFD, FLUENT) for multiphase flow, gas sensors, supersonic nozzles, thrusters, and pharmaceutical applications.
- Designed instrumentation using heat transfer Finite Element Analysis (FEA) software (ALGOR).

Harvard University, Cambridge, MA

Jan 2005 to Jan 2007

Research Engineer, School of Engineering and Applied Sciences

- Designed and built a new instrument to detect phase change irreversibility of nanometer-sized airborne particles using an on-line technique.
- Supervised the design and development of an environmental chamber for studies of aerosol particle chemistry and physics.
- Developed software for instrument automation and data analysis.

Acillix Inc., Somerville, MA

Sep 2005 to Sep 2006

Principal Engineer (startup)

- Designed and constructed a pilot-scale test facility for a new microbial-based technology.
- Conducted tests of an environment-friendly patent-pending method which uses microorganisms to demineralize water.

Paul Scherrer Institute, Villigen-PSI, Switzerland

2001-2004

Research Engineer / Project Manager, General Energy Department

- Developed and characterized an environmental chamber to simulate atmospheric smog chemistry.
- Designed and built an instrument to measure the volatility of polymerizing nanometer-sized aerosol particles.
- Promoted to project manager (2003) with subsequent findings published in *Science* (2004).
- Designed an automated instrument flow system which has been adopted by internationally recognized projects.
- Wrote software programs for human-machine interface, process control, data management and storage, and data analysis.
- Trained and advised undergraduate and graduate students.

University of Minnesota, Minneapolis, MN

1999-2001

Graduate Research Assistant, Department of Mechanical Engineering, Power and Propulsion Division

- Designed particulate sampling systems for diesel and spark ignition after-treatment device testing.
- Developed passive and active dilution systems for sensitive instrumentation.
- Conducted field studies of heavy-duty truck and passenger car emissions.
- Assisted in the design and construction of a mobile laboratory for on-road combustion aerosol particle sampling and diesel particulate filter testing.

Undergraduate Research Assistant

1996-1999

- Individually designed, built, and calibrated a nanoparticle-sizing spectrometer.
- Calibrated and maintained gas analyzers, particle instruments, and engine/dynamometer controls.
- Assisted in development, testing, and data analysis of engine exhaust dilution tunnels.
- Carried out engine breakdown and rebuild.

Driv-Lok, Sycamore, IL (press-fit fastener manufacturer)

1992-1994

Maintenance Technician

- Summer employment during college.
- Machine maintenance.
- Non-critical welding repairs
- Chemical neutralization and maintenance

Licensure:

- 1998- Engineer in training (EIT), passed Fundamentals of Engineering Examination
- Preparing for PE examination and certification

Professional Societies:

- American Association for Aerosol Research
- Association of Energy Engineers (AEE)
- 2000- Society of Automotive Engineers (SAE)
- 1997- Member of Tau Beta Pi, The National Engineering Honor Society

Honors:

- 2000 Recipient, Murphy-Robertson Research Fellowship in Power and Propulsion
- 1998 Recipient, G. Bjorge Civil Engineering Scholarship

Second Languages:

- Conversational German
- Understanding of Swiss German

Additional Education:

- **ETH, Zurich** **2001-2004**
Ph.D., Science, Department of Chemistry and Applied Biosciences

Volunteer Activities:

- Association of Energy Engineers (AEE), Columbia River Chapter
- Spruce up Laurelhurst Park – Portland, Oregon
- The ReBuilding Center – Portland, Oregon