Essam M. El-Hannouny

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RESEARCH INTERESTS

High-speed laser imaging for fuel spray
Optical and x-ray Techniques
Engine combustion and emissions

EDUCATION

Ph.D.-University of Wisconsin–Madison, Engine Research Center, ERC, 2002.
M.S.-University of Wisconsin–Madison, ERC, 1999
M.S.-Helwan University, Cairo, Egypt, 1994
B.S.- Helwan University, Cairo, Egypt, 1987 (first with honor for five years)

CURRENT WORK

Post Doctorate position at Argonne National Laboratory*: Feb. 2003- present*

- Working on Caterpillar/Argonne Diesel Emissions Reduction CRADA project. The project title is "Quantifying the Effects of Fluid Flow Characteristics Near the Nozzle Tip on Diesel Engine Particulate Emissions".
- Working closely with Modeling group at Helsinki University of Technology, Finland, to simulate the spray characteristics using x-ray at the Advanced Photon Source, Argonne National Laboratory.
- X-ray and optical measurements of high pressure diesel sprays for heavy duty diesel engine.
- Performing the first ever spray characterization for GM Locomotive Engine, Electro-Motive Division, using high-speed laser imaging technique to meet the future locomotive emission regulations.

EXPERIENCE

Post Doctorate position at ERC, University of Wisconsin-Madison*: Nov. 2002-Feb. 2003*

- Spray injection systems development and assist to set up an optical engine at the ERC, University Of Wisconsin-Madison.

Project Assistant, March 1998 – 2002

- Designed and developed an optical spray chamber to test the diesel spray characteristics for Common Rail (CR) injection system and HEUI (Caterpillar) injection system for passenger car.
- Spray Analysis using DIFFRACTION METHOD (Malvern System) and LIGHT EXTINCTION METHOD

College of Engineering, Helwan University Cairo, Egypt
Master student, 1991-94

- Measured the fluctuating temperature using the Fine-Wire Thermocouple Technique compensated for the effects of thermal inertia (measuring the thermocouple Time Constant using on-line Pulsing Technique).

Yasin Co., Cairo, Egypt
Project Assistant, 1990-92

- Assisted on energy saving program for glass melting furnaces and annealing furnaces.
- Assisted on putting a measuring devices and heat exchangers to improve the fuel consumption for those furnaces. Map the temperatures field for those furnaces. This work led to a 3.5-ton fuel/day consumption reduction.

College of Engineering, Helwan University, Cairo, Egypt
Teaching and Research Assistant, 1989-96

- Investigated the effect of the intake angle on the engine performance using Ricardo E-6 gasoline Engine with variable compression ratio.
- Taught the flowing undergraduate courses: Internal Combustion Engines, Heat Engines, Thermal & Mech. Measurements, Hydraulic Machines, and Steam Engineering.
- Preparing, administering, and grading quizzes.
- Supervising weekly laboratory experiments, (Thermal & Mech. Measurement course).

Steam Power Station, North Cairo, Egypt
Intern Engineer, 1985

- Worked with a group of 15 to maintain the operation of the steam turbines, steam boiler

AWARDS & HONORS

- 2001 Vilas Fellowships Award, University of Wisconsin-Madison
- A merit scholarship for four years (83-86), Helwan University, Cairo, Egypt.
- Engineering Syndicate prize (1988), Cairo, Egypt.
- M.S. Scholarship form University of Helwan, Cairo, Egypt.
- PhD. Scholarship form University of Helwan, Cairo, Egypt.

PUBLICATIONS

- "Near Nozzle Diesel Spray Modeling and X-Ray Measurements", Ville Vuorinen, Eero Antila, Ossi Kaario, Martti Larmi, Essam El-Hannouny, and Sreenath Gupta, to be published SAE 2006.
- "Time Resolved X-Ray Measurements of Diesel Sprays at Elevated Back Pressure", Essam M. EL-Hannouny, Sreenath Gupta, Christopher F. Powell, Seong-Kyun Cheong, and Jin Wang ILASS 2005.
- "Near-Nozzle Spray Characteristics of Heavy-Duty Diesel Engine", Essam M. EL-Hannouny, Sreenath Gupta, Christopher F. Powell, Seong-Kyun Cheong, Jinyuan Liu, Jin Wang and Raj R. Sekar, SAE, 2003-01-3150.
- "Effect of Injection Parameters and Injection System on Spray Characteristics for HSDI Diesel Engines", Essam. M. El-Hannouny and Patrick V. Farrell, ICLASS 2003, Italy
- "An Experimental and Numerical Study of Injector Behavior for HSDI Diesel Engines", Essam M. El-Hannouny, Taewon Lee, Patrick V. Farrell and Rolf D. Reitz , SAE 2003-01-0705.
- "Spray Characteristics for Hydraulically Actuated High Pressure Injection Systems for small Bore HSDI Diesel Engines" Essam M. El-Hannouny and Patrick V. Farrell, ILASS 2002, Madison WI. 53706.
- "Two-phase flow visualization for fuel sprays", P.V. Farrell, E. El-Hannouny, D. Rhim and P. Borthwick, 9th international symposium on flow visualization, 2000.
- "The Aerodynamic and Temperature Fields in the Developing Region of Heated Multi-jet Flows", Ahmed, A.M.Y.; El-Hannouny, E.M.; Moneib, H.A. and Elbahar, O.M.F Engineering research Journal, Cairo, Egypt, April, 1994.

AFFILIATIONS

- Member of the Society of Automotive Engineers (SAE).
- Member of the American Society of Mechanical Engineers (ASME).
- Member of the Institute for Liquid Atomization and Spray Systems (ILASS).
- Egyptian Engineering Syndicate, Cairo, Egypt
- The Engineering research Bulletin, Helwan University, Cairo, Egypt