



**Exponent<sup>®</sup>**  
Engineering & Scientific Consulting

**Mohammad Feyz, Ph.D.**

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## Professional Profile

Dr. Feyz is expert in the thermal analysis of reacting systems involving combustion, emissions, and chemical processes. His fundamental understanding in thermal and fluids science can serve applications in infrastructures, consumer products, automotive, aerospace, batteries and fuel cells, and fire and explosion safety.

Dr. Feyz performs simulation and cause analysis of fire and explosion failures instigated by gaseous, liquid and solid fuels in the context of oil and natural gas industries as well as structure and wildland. His understanding of electrical ignition has assisted the clients in the utility sector to improve the safety of their facility in the urban and rural areas.

Dr. Feyz's analytical ability allows for rigorous simulation of transient physical processes involved in thermal incidents and helps in quantification of contributing factors. In addition to the fundamental analytics, conducting high-fidelity CFD simulation of thermal and reacting systems is another area in which Dr. Feyz has vast knowledge and capabilities.

Dr. Feyz is also interested in analysis of integrated modern technologies for heat recovery and energy storage which can preserve the energy loss from power plants, steel, cement, and glass manufacturing industries. He has assisted industries to come up with novel designs to utilize the thermal waste energy and converting the thermal loss to potential commodity. In the area of alternative fuels, he has put forth a valuable methods of hydrogen production that offers outstanding conversion efficiency. Dr. Feyz is capable of counseling the clients to implement safety measures regarding the use of landfill, shale and synthetic gas.

## Academic Credentials & Professional Honors

Ph.D., Mechanical Engineering, Purdue University, 2019

M.Sc., Mechanical Engineering, Ferdowsi University of Mashhad, Iran, 2013

B.Sc., Mechanical Engineering, Ferdowsi University of Mashhad, Iran, 2010

Awardee of "SET Fellowship Award" Doctoral Student Research Fellowship for Continuing PhD Student, Purdue Engineering, 2018

## Prior Experience

Research assistant in Combustion and Propulsion Research Lab, Purdue School of Engineering and Technology, 2015–19

Research assistant in Internal Combustion Engines lab, Ferdowsi University of Mashhad, 2008–13

## Professional Affiliations

American Society of Mechanical Engineering (ASME)

The Combustion Institute

## Patents

Feyz, M. E., Nalim, M. R., "Pressure-gain fuel reformer for fuel cell and internal combustion engines.",  
Invention disclosure, Indiana University(2017)

## Publications

### Peer-Reviewed:

Feyz, M. E., M. R. Nalim, V. R. Hasti, and J. P. Gore. "Scalar Predictors Of Premixed Gas Ignition By A Suddenly-Starting Hot Jet" International journal of Hydrogen Energy (2019).

Feyz, M. E., M. R. Nalim, V. R. Hasti, and J. P. Gore. "Modeling and Analytical Solution of Near-Field Entrainment in Suddenly Started Turbulent Jets." AIAA Journal (2019):1-8.

Feyz, M. E., V. R. Hasti, J. P. Gore, and M. R. Nalim. "Large eddy simulation of hot jet ignition in moderate and high-reactivity mixtures" Computers & Fluids (2019).

Feyz, M. E., M. R. Nalim, Md N. Khan, A. Tarraf, and K. Y. Paik. "Three-Dimensional Simulation of Turbulent Hot-Jet Ignition for Air-CH<sub>4</sub>-H<sub>2</sub> Deflagration in a Confined Volume." Flow, Turbulence and Combustion 101, no. 1 (2018): 123-137.

Jagannath, Ravichandra, Sally P. Bane, M. E. Feyz, and Mohamed R. Nalim. "Assessment of Incidence Loss and Shaft Work Production For Wave Rotor Combustor with Non-Axial Channels." In 55th AIAA Aerospace Sciences Meeting, p. 1749. 2017.

Feyz, Mohammad Ebrahim, Javad Abolfazli Esfahani, I. Pishbin, and SMR Modarres Razavi. "Effect of recess length on the flame parameters and combustion performance of a low swirl burner." Applied Thermal Engineering 89 (2015): 609-617.

Feyz, M. E., Seyyed Iman Pishbin, Mohsen Ghazikhani, and SMR Modarres Razavi. "Parametric assessment of a low-swirl burner using the exergy analysis." Energy 79 (2015): 117-126.

Ghazikhani, Mohsen, M. E. Feyz, I. Khazaei, Ali Ghazikhani, and Seyed Mohammad Javid Mahmoudzadeh Akherat. "Effect of a new wet soot absorber on soot removal of a diesel engine." Scientia Iranica 21 (2014).

Feyz, M. E., and Javad Abolfazli Esfahani. "Exergetic performance of a cylindrical methane-air microcombustor under various inlet conditions." International Journal of Exergy 15, no. 3 (2014): 257-275.

Ghazikhani, Mohsen, M. E. Feyz, Omid Mahian, and Ali Sabazadeh. "Effects of altitude on the soot emission and fuel consumption of a light-duty diesel engine." Transport 28, no. 2 (2013): 130-139.

Ghazikhani, Mohsen, M. E. Feyz, and A. Joharchi. "Experimental investigation of the exhaust gas recirculation effects on irreversibility and brake specific fuel consumption of indirect injection diesel engines." Applied Thermal Engineering 30, no. 13 (2010): 1711-1718.

## Conference Proceedings:

"Statistical analysis of scalars for ignition via transient hot jet", M. E. Feyz, M. R. Nalim, V. R. Hasti, J. P. Gore, 11th U. S. National Combustion Meeting, March 24-27, 2019, Pasadena, California.

"A Hybrid Model for Mass Entrainment to Transient Jets," (Paper AIAA-2018-4610), M. E. Feyz, Razi Nalim, AIAA Propulsion and Energy forum, 9-11 July 2018, Duke Energy Convention Center, Cincinnati, Ohio.

"Analytical study on near-field entrainment in a transient turbulent free jet", M. E. Feyz, Razi Nalim, J. P. Gore, Ali Tarraf, 10th U. S. National Combustion Meeting, April 23-26, 2017, College Park, Maryland.

"Experimental Study of Natural Gas Fuel Temperature Influence on Radiation Enhancement and Emission ", M. Javadi, M. Moghiman, P. Nikuieian, M. E. Feyz, Proceedings of the ASME2010 Biennial Conference on Engineering systems Design and Analysis, July 12-14, 2010, Istanbul, Turkey.

"Development of an Analytical Model to Predict Flame and Wall Temperature of a Radial Micro-combustor", J. A. Esfahani, M. E. Feyz, M. Kimiaghalam, The 2nd International Conference on Engineering and ICT , February 2010, Melaka, Malaysia.

"Analytical Investigation on the Effects of Exhaust Gas Recirculation (EGR) on in-cylinder residual gas mass fraction in an IDI Diesel Engine ", M.ghazikhani, M.E.Feyz, P. Nikuieian, The Sixth International Conference on Internal Combustion Engines, November 17-19, 2009, Olympic Hotel, Tehran, Iran.

"Experimental Investigation on the Effect of EGR on the Second Law Efficiency in Diesel Engines", M. Ghazikhani, M.E. Feyz, A. Joharchi, The Seventh Annual International Conference of Mechanical Engineering (ISME), 2009, Iran ,Tehran, Tehran University, March.

## Presentations

"Waste Heat Energy Trade: A Business Strategy towards Carbon-Neutral Industries" MIT SOLVE, United Nations HQ, New York City, March 2017. (<https://www.youtube.com/watch?v=2IIIIEq32VjA&t=205s>)

"Analytical modeling and large-eddy simulation of transient hot jet ignition" Alternative Fuels and Combustion Research Lab, Michigan State University, May 2018.

## Project Experience

Developed risk assessment study for natural gas leakage at regulating stations. Carried out flammability calculations considering the role of inert gas in mitigation of the ignition risk.

Considered the effect of wind on the air exchange behavior of the building and its effect on the ignition hazard.

Conducted modeling for risk assessment of natural gas pipelines exposed to external flames.

Investigated the thermal failure of electronic caused by consumer abuse.

## Peer Reviews

Reviewer for the Journal of Fuel

Reviewer for Case Studies in Thermal Engineering

Reviewer for Journal of Fluid Mechanics

Reviewer for the ASME Turbo Expo 2017

STEM leader at Minority Engineering Advancement Program (MEAP) at Indiana University-Purdue University 2015-2017