

JAI M. MEHTA

Phone: 312-358-2006 • **e-mail:** jmm060793@gmail.com • **ORCID:** 0000-0002-1778-7351 • **LinkedIn:** linkedin.com/in/mehta-jai

Mechanical engineer with strong practical, theoretical and research capabilities as result of my extensive education and hands on internships. My passion for engines – automotive, gas turbine or propulsion have driven my desire to pursue my doctorate to impart sustainability to a world heavily reliant on fossil fuels. I am highly skilled in thermodynamics and fluid dynamics with experience in mechanical design and extensive data analysis and interpretation.

EDUCATION

PhD (Mechanical Engineering), Summer 2022 (4.0/4.0)

University of Illinois at Chicago, Chicago, USA

M.S. (Mechanical Engineering), 2018 (4.0/4.0)

University of Illinois at Chicago, Chicago, USA

B.E. (Mechanical Engineering), 2016 (8.72/10.0)

University of Mumbai, Mumbai, India

Dip. (Mechanical Engineering), 2013 (8.89/10.0)

Shri Bhagubhai Mafatlal Polytechnic, Mumbai, India

EXPERIENCE

University of Illinois at Chicago, Chicago, USA - Research Assistant, High Pressure Shock Tube Laboratory, 2017 – present

- Study of natural gas and methane for propulsion applications – Shock Tube
- Compressible flow and boundary layer characterization for a shock tube
- Analysis of military jet fuels for prediction of ignition properties – GC x GC – TOF/FID
- Designing and manufacturing of high-pressure high temperature supersonic flow equipment
- Development of high flow rate mixing apparatus
- Computational analysis of high-speed flows.
- Chemical kinetic analysis of natural gas and military jet fuels
- Ignition Quality Tester (IQT)

B.E.S.T Undertaking, Mumbai, India – Engineering Intern, Transportation Engineering, 2013

- Overhauling and modification of powertrain components – gearbox, differential, engines, transfer case etc.
- Conversion by retrofitting of diesel engines to natural gas powered engines.
- Improvement of hydraulic clutch actuation system to reduce maintenance cycle and reduce driver fatigue

Air India Ltd., Mumbai, India – Engineering Intern, Engine Overhauling Division, 2011

- Overhauling of turbofan engines - GE-90, GE-CF60/80C2, PW 4000 series and CFM56 and APUs
- Turbofan engine and APU static testing
- Overhauling of aircraft hydraulic system and fuel supply system.

SKILLS

- Computer Aided Design and Drawing – **SolidWorks, Autodesk Inventor, AutoCAD, FluidSim, ANSYS**
- Computer Programing – **Python, R, C++, Fortran, SAS**
- **Gas Chromatography and Mass Spectrometry**
- **Data Science and Statistics**
- **Chemical Kinetics and CFD**

PUBLICATIONS

- **Mehta, J M, Brezinsky, K.** Experimental speciation study of natural gas oxidation using a single pulse shock tube. Int J Chem Kinet. 2021; 53: 845–867. <https://doi.org/10.1002/kin.21487>
- **Dalmiya, A., Mehta, J M., Tranter, R S., Lynch P T.** High pressure, high flow rate batch mixing apparatus for high throughput experiments. Rev. Sci. Instrum. 2021; 92. 114104 <https://doi.org/10.1063/5.0071472>
- **Han, X., Mehta, J M., Brezinsky, K.** Shock tube study of natural gas oxidation at propulsion relevant conditions Combust. Flame. 2019; 209; 1-12. <https://doi.org/10.1016/j.combustflame.2019.07.022>
- **Mehta, J M.** Optimization of Pressure and Temperature Characteristics of a High Pressure Shock Tube. University of Illinois at Chicago. Thesis. 2018. <https://hdl.handle.net/10027/22678>
- **Mehta, J M, Wang, W, Brezinsky, K.** Experimental speciation study of natural gas oxidation using a single pulse shock tube. Proc. Combust. Inst. 2022; 39. [SUBMITTED]
- **Abdulrahman, M., Mehta, J M, Lynch, P T., Brezinsky, K.** Experimental and modeling study of oxidative-pyrolysis of F-24 and specialty jet fuels using fuel-surrogate approach. Proc. Combust. Inst. 2022; 39. [SUBMITTED]
- **Sheyyab, M., Mehta, J M, Lynch, P T., Brezinsky, K.** Prediction of derived cetane number from UNIFAC group compositions of hydrocarbon mixtures with machine learning models. Proc. Combust. Inst. 2022; 39. [SUBMITTED]

POSTERS AND PRESENTATIONS

- **Mehta, J M.,** Abdulrahman M., Sheyyab M., Lynch P T., Brezinsky K. Ignition property prediction model, 3rd CUP Workshop, Madison, WI, November 17-18,2021.
- **Mehta J M.,** Brezinsky K. Optimization of shock tube performance in the reaction region at high temperatures and pressures, , 11th U. S. National Combustion Meeting, Pasadena, CA, March 24-27,2019.
- Han X., **Mehta J M.,** Brezinsky K., A Revisit of Constant Temperature Approximation in Chemical Kinetics Study Using Single Pulse Shock Tubes with Speciation, 11th U. S. National Combustion Meeting, Pasadena, CA, March 24-27,2019.
- Dalmiya, A., **Mehta, J M.,** Laich, A., Lynch P T. High pressure, high flow rate batch mixing apparatus, 11th U. S. National Combustion Meeting, Pasadena, CA, March 24-27,2019.

PROJECTS

Design of Intake and Exhaust System for Formula SAE Car, 2016

- *Design of a new intake manifold based on ram induction theory to overcome the effect of restricted air flow*
- *Design of exhaust system to compliment the intake system and to minimize the exhaust noise to below 110 dBc*
- *CFD analysis of the system using ANSYS*
- *Prototyping and manufacturing of the intake system using additive manufacturing (SLS)*

Computer Numeric Controlled (CNC) milling machine, 2013

- *Design and fabrication of 3 axis stepper motor-controlled mill*
- *Electronic and control board to operate the mill using G and M codes*

LEADERSHIP EXPERIENCE

- Head of Engine Department at DJS Racing (Formula SAE Team – Dwarkdas J. Sanghvi College of Engineering)
- Driver at DJS Racing (Formula SAE Team – Dwarkdas J. Sanghvi College of Engineering) – Formula Student India 2016
- Cultural Secretary in Student Council – Shri Bhagubhai Mafatlal Polytechnic
- Treasurer - Indian Graduate Student Association of UIC