








Harshil Pisavadia

MSc in Mechanical Engineering | Engineer In-Training

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 pisavadi@ualberta.ca  +1 780 271 3845  Edmonton, Alberta, Canada  Canadian and Australian Citizen

TECHNICAL SKILLS

Finite Element Analysis (FEA)	LS-DYNA, HyperWorks, ABAQUS, ANSYS
Computational Fluid Dynamics (CFD)	ANSYS, STAR-CCM+
Programming	MATLAB, Python, Bash, LATEX, SMath, Mathematica, Visual Basic, AutoHotKey
3D Modelling	SolidWorks, Blender, AutoCAD/Inventor, CATIA

PROJECTS

DEVELOPMENT OF A DYNAMIC FAILURE MODEL FOR POLYMERIC ADHESIVES

APRIL 2020 - TODAY

 [Centre for Design of Advanced Materials](#)  [One Slide Summary](#)

Developing a cohesive zone finite element model to simulate the dynamic failure of adhesives used in hybrid armor systems for land vehicles under high-velocity ballistic impact using LS-DYNA simulation software package. This project is in collaboration with General Dynamics Land Systems, NP Aerospace, and Defence Research and Development Canada (DRDC).

[LS-DYNA](#) [HyperWorks](#) [Blender](#) [SolidWorks](#) [Python](#) [MATLAB](#) [Bash](#)

HEAVY-DUTY COMPRESSED NATURAL GAS FUEL RAIL DESIGN

MAY 2019 - AUGUST 2019

 [Poster](#)

Led a team of five students to pioneer the design of a compressed natural gas fuel rail for heavy-duty diesel engines to be installed in a full-scale dual-fuel semi-trailer truck.

- > Complied with ASME/BPVC, NGV 3.1, and ISO 15500 standards to define design parameters
- > Performed detailed stress and deformation analysis of the fuel rail using ANSYS to locate high stress concentrations zones
- > Conducted CFD analysis inside fuel rail to determine the flow and temperature distribution using the ANSYS CFX module
- > Prepared reports containing cost estimates, 3D renders and detailed drawings of the prototype, and safety requirements

[SolidWorks](#) [ANSYS](#) [SMath](#)

PROFESSIONAL EXPERIENCE

Today
April 2020

Center for Design of Advanced Materials – Dr. James Hogan’s Research Group, Edmonton, AB

Modelling Team Lead

- > Leading the CDAM modelling team to develop a state-of-the-art system-scale hybrid armor model
- > Simulating high-speed ballistic impact events on a full-scale hybrid armor model using LS-DYNA with parallel and cluster computing (bash scripting in Compute Canada)
- > Automating the 3D model generation of ceramic tiles taking into account manufacturing defects (e.g., tolerances and adhesive seepage) using Blender coupled with Python scripting
- > Communicating research output to industrial collaborators and academics through presentations in monthly Alliance Science meetings and biweekly group meetings
- > Leading weekly writing workshops by mentoring students to improve their article/thesis writing skills
- > Assisting the Principal Investigator in project and research management, including proposal drafting, budgeting and scheduling
- > Assisted in organizing the Canadian Society for Mechanical Engineering 2022 International Congress

December 2019
April 2019

Research and Development Engineer Intern

Collaborated with Milburn Mountain Defense and DRDC to design armor plates and platens:

- > Used SolidWorks and CATIA to create 3D models and drawings of armor plate assemblies
- > Communicated with collaborators through presentations and detailed technical reports highlighting updates to the design and methods used (e.g., coordinate-measuring machine, 3D scanner)

Collaborated with US Army Research Laboratory and DRDC for Synthetic Microstructure Project:

- > Performed MATLAB processing of material microstructures for next generation material development
- > Generated 3D representations of secondary phase particles using statistical distributions by assigning orientation angles, distances, and methods to populate them using MATLAB

December 2019 September 2019	Alberta Health Services, Edmonton, AB <i>Engineer Intern</i> <ul style="list-style-type: none"> Involved in the development of an osseointegration prosthetic limb prototype using reverse engineering techniques by 3D scanning, instrumentation techniques, and 3D modelling with SolidWorks Performed dynamic analysis of a bone anchored hearing aid implant model using ABAQUS
January 2019 September 2018	International Cooling Tower (ICT), Edmonton, AB <i>Engineer Intern</i> <ul style="list-style-type: none"> Created cost estimate templates using VBA within Excel for sections of a crossflow cooling tower (e.g., fan deck, louvers, sealants, stairways) taking user inputs of overall dimensions and materials Designed and developed detailed drawings of a sample testing rig using AutoCAD to analyse nozzle spray patterns and ensured strict company safety protocol under its operation Modified and updated ICT design standards using AutoCAD, ensuring design constraints are satisfied Reviewed, identified, and eliminated discrepancies in engineering drawings of a multi-million-dollar cooling tower project using AutoCAD
May 2018 August 2018	Dr. Morris Flynn's Research Group, Edmonton, AB <i>Research Assistant</i> Participated in "Minimizing the Visible Plume Produced by Cooling Towers" research project in collaboration with ICT: <ul style="list-style-type: none"> Developed conceptual designs of a counterflow cooling tower's plenum chamber using SolidWorks Converted a coaxial plume MATLAB model to Python programming language
December 2017 May 2016	Dr. Arthur Mar's Research Group, Edmonton, AB <i>Research Assistant</i> <ul style="list-style-type: none"> Developed a AutoHotKey script to efficiently export >300,000 crystallographic information files from Pearson's Crystal Database saving several months of processing time and funds to hire personnel Presented research output of "Frustrated Machine Learning : The Case of Polymorphism in Titanium Iron Phosphide" at North American Solid-State Chemistry Conference 2017

EDUCATION

August 2022 September 2020	Master of Science in Mechanical Engineering <i>University of Alberta, Edmonton, Alberta, Canada</i> <ul style="list-style-type: none"> Cumulative GPA: 4.0/4.0 Thesis title: Development of a Dynamic Failure Model for Polymeric Adhesives used in Hybrid Armor Systems for Land Vehicles <div> Cohesive Zone Modelling Impact Dynamics Finite Element Analysis Fracture Mechanics Statistical Mechanics </div>
April 2020 September 2015	Bachelor of Science in Mechanical Engineering Co-Op, Mathematics Minor <i>University of Alberta, Edmonton, Alberta, Canada</i> <ul style="list-style-type: none"> Cumulative GPA: 3.8/4.0 Graduated with Distinction Capston project: Heavy-Duty Compressed Natural Gas Fuel Rail Design <div> Computational Fluid Mechanics Structural Design Thermodynamics </div>

PUBLICATIONS

- Pisavadia H, Toussaint G, Dolez P, Hogan J. Cohesive Zone Failure Modelling of Polymeric Adhesives used in Armor Systems. *International Journal of Impact Engineering*. (Submitted October 2021).
- Mohamed M, Pisavadia H, Westover L. Dynamic Analysis of the Bone Anchored Hearing Aid System using Finite Element Method. *Journal of Biomechanics*. 124(2). (2020).
- Oliynyk A, Adutwum L, Rudyk B, Pisavadia H, Lotfi S, Hlukhyy V, Harynuk J, Mar A, Brgoch J. Disentangling Structural Confusion through Machine Learning: Structure Prediction and Polymorphism of Equiatomic Ternary Phases ABC. *Journal of the American Chemical Society*. 139(49): 17870-17881. (2017).

ADDITIONAL INFORMATION

- Proficient in English and Gujarati
- Member of the Nautical Research Guild
- Interests: Model ship building; Gardening; Health and Fitness; Cooking