

EMPLOYMENT HISTORY

•Researcher

Rolls Royce University Technology Center in Thermal Management (40hrs/week)

Sep. 2023 - Present

Busan, South Korea

EDUCATION

•Pusan National University (PNU)

MS in Mechanical Engineering (Major - Energy System); GPA: 4.44/4.50, Rank - 2

Sep. 2021 - Aug. 2023

Busan, South Korea

Thesis - Numerical Analysis and Modeling of Indoor Airborne Viral Transmission

Advisor - Prof. Man Yeong Ha

•Indian Institute of Technology (IIT) Indore

Bachelor of Technology in Mechanical Engineering; GPA: 8.49/10.0

July 2017 - May 2021

Indore, India

Thesis - Heat transfer characteristics of Synthetic Jet Impingement on Heated Surface

Advisor - Dr. Harekrishna Yadav

AREA OF INTEREST

- Turbulent and Multiphase Flow Modelling, CFD

PROJECTS

•Experimental, CFD, and 1D Analysis of Fuel Cooled Oil Cooler (FCOC) Heat Exchanger Sep. 2023 - Cont.

Rolls Royce

- Design and development of an FCOC heat exchanger for application in Rolls-Royce engines.
- Development of numerical and 1D tools for the prediction of heat transfer characteristics and fuel de-congealing time under the given operating conditions.

•Numerical Analysis and Modeling of Indoor Airborne Viral Transmission

Sep. 2021 - Oct. 2023

Prof. Man Yeong Ha (PNU), Prof. S. Balachandar (University of Florida), LG Electronics

- Worked on a collaboration project between PNU, University of Florida, and LG South Korea. I developed the RANS methodology to study indoor airborne transmission.
- Wrote UDF code to model (1) fluid velocity perturbations using normalized Langevin equation, (2) Lagrangian framework for micro and submicron size particles, and (3) Effect of AC unit's filtration efficiency.
- Conducted experiments at LG facilities on micro-sized particle dispersion to validate the results of numerical simulations.
- Studied Virus transmission scenarios using MATLAB code to find out the safe distance between the infected person (virus source) and healthy person (sink), optimal configuration for source and sink location in an indoor room, occupancy limit, and optimal AC configuration.

•Heat transfer characteristics of Synthetic Jet Impingement on Heated Surface

March 2020 - May 2021

Dr. Harekrishna Yadav (IIT Indore)

- Designed experiments to study the effect of the Strouhal number on synthetic jet heat transfer characteristics.
- Studied synthetic jet performance by examining the heat transfer aspects of the heated surface under conditions of (1) keeping Reynolds number constant and varying Strouhal number, (2) keeping Reynolds number and diaphragm amplitude constant and varying Strouhal number, (3) Varying Orifice to plate distance.

•Flow and thermal analysis of Converging-Diverging (CD) supersonic nozzle

Dec. 2018 - Feb. 2020

Dr. Yuvraj K Madhukar, IIT Indore

Report

- Performed experiments and numerical simulations to study the flow and thermal characteristics of CD nozzle to use in Plasma Arc Cutting.
- Performed CFD simulations using Ansys Fluent to find pressure boundary conditions for optimal expansion of flow outside the nozzle.
- Conducted Schlieren shadowgraph to visualize the flow outside the designed CD nozzle for Shock analysis.

•Turbulence statistics of fully developed flow

March - June 2022

Dr. Hwang Jinyul, PNU

GitHub

- Studied turbulence statistics of fully developed flow in a rectangular channel at a low Reynolds number.
- Wrote MATLAB code from scratch to evaluate velocity fluctuations, Reynolds stresses, time scales, energy spectra, etc. based on DNS data.

TECHNICAL SKILLS

- **Computer Languages/OS:** Python, C/C++, Fortran, OpenMP, MATLAB, LaTeX, Linux
- **CAE/CAD:** Ansys Fluent, UDF Coding, SolidWorks, CATIA, AutoCAD, Ansys Design Modeler
- **Tools:** Simcenter Amesim, Paraview, Inkscape

RESEARCH PUBLICATIONS

- **K. Choudhary**, K.A. Krishnaprasad, N. Zgheib, M. Ha, and S. Balachandar, Effect of room size, shape, AC placement, and air leakage on indoor airborne viral transmission, *Building and Environment*, 244, 110834 (2023), <https://doi.org/10.1016/j.buildenv.2023.110834>
- **K. Choudhary**, K.A. Krishnaprasad, S. Pandey, N. Zgheib, J. Salinas, M. Ha, and S. Balachandar, Effectiveness of RANS in predicting indoor airborne viral transmission: A critical evaluation against LES, *Computers & Fluids*, 256, 105845 (2023). <https://doi.org/10.1016/j.compfluid.2023.105845>
- K.A. Krishnaprasad, N. Zgheib, M. Ha, **K. Choudhary**, C.Y. Choi, K.S. Bang, S. Jang, and S. Balachandar, Existence of a non-zero worst-case ACH for short-term exposure in ventilated indoor spaces, *Indoor Air*, Status - **Revised Manuscript Submitted**.

CONFERENCES

- **K. Choudhary**, Chinmay Lote, Pawan Sharma, Santosh Kumar Sahu, Harekrishna Yadav, "Investigation of Fluid Flow and Heat transfer Characteristics of Synthetic Jet Impingement at different Strouhal Number", IIT Madras India, *International ISHMT-ASTFE Heat and Mass Transfer Conference* (Dec. 17-20, 2021).
- **K. Choudhary**, K.A. Krishnaprasad, S. Pandey, S. Balachandar, M. Ha, "Flow characteristics of 4-way air conditioner cassette within a room consisting of a window", Jeju S.Korea, *Korean Society of Mechanical Engineers Conference (KSME)* (Nov. 2022).
- K.A. Krishnaprasad, Nadim Zgheib, Jorge Salinas, S. Balachandar, MY Ha, **K. Choudhary**, "Risk assessment using a fluid-mechanics informed statistical framework for short and long-term exposure for indoor airborne viral transmission", *Bulletin of the American Physical Society*, George Washington University (Nov. 2023).

ONLINE COURSES

- | | |
|---|--------------------|
| • Neural Networks and Deep Learning , DeepLearning.AI (Coursera) | <i>Certificate</i> |
| • Convolutional Neural Networks , DeepLearning.AI (Coursera) | <i>Certificate</i> |
| • Object-Oriented Data Structures in C++ , University of Illinois (Coursera) | <i>Certificate</i> |
| • Digital Signal Processing 1: Basic Concepts and Algorithms , EPFL (Coursera) | <i>Certificate</i> |

EXTRACURRICULAR ACTIVITIES

- | | |
|--|-----------------------------|
| • Club Member , CAE Club, IIT Indore | <i>Jan. 2018 - May 2021</i> |
| • 4th Place in Star Cluster Identifier, Inter IIT Tech Meet 7.0, IIT Bombay | <i>Nov. - Dec. 2018</i> |

ACHIEVEMENTS

- | | |
|---|----------------|
| • In top 0.75% Among 1.2 million candidates in IIT-JEE 2017 Exam | <i>2017</i> |
| • Brain Korea (BK21) government scholarship recipient | <i>2021-23</i> |

REFERENCE

Prof. Man Yeong Ha

Professor, School of Mechanical Engineering
Pusan National University, Busan, South Korea
myha@pusan.ac.kr

Prof. Sivaramakrishnan Balachandar

Professor, Dept. of Mechanical & Aerospace Engineering
University of Florida, Gainesville, FL 32611, USA
bala1s@ufl.edu