Khaled Mosharraf Mukut

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EDUCATION

MS in Mechanical Engineering (Energy System)   **Summer 2019**
Marquette University, Wisconsin, USA
> Research Topic: "Stochastic Modeling of Soot Particles in Combustion Systems"
> Advisor: Dr. Somesh Roy

BS in Mechanical Engineering   **March 2016**
Bangladesh University of Engineering and Technology(BUET), Dhaka, Bangladesh
> Thesis title: "Numerical Investigation on Active Control for Drag Reduction in NACA 4412 Airfoil"
> Advisor: Dr. Mohammad Ali

RESEARCH INTERESTS

- Stochastic Soot Modeling
- Molecular Dynamics
- Computational Fluid Dynamics
- Clean Combustion
- Radiative Heat Transfer
- Chemical Kinetics

RESEARCH EXPERIENCE

Graduate Research Assistant   **August 2017-Present**
Department of Mechanical Engineering
Marquette University
- Characterizing multiphysics interaction in combustion devices.
- Detailed multi-scale stochastic modeling of soot.
- Radiation modeling in multiphase combustion systems.
- Studying EGR and Radiation effects on soot production in spray combustion systems.

Graduate Assistant   **March 2016-August 2017**
Department of Mechanical Engineering
Bangladesh University of Engineering & Technology (BUET)
- Molecular Dynamics investigations of explosive boiling characteristics.
- Investigating caviation and bubble nucleation in nano-confinements.
- Thermodynamic characterization of the critical heat flux density and inherent metastability in nano-scale boiling heat transfer.
- Studying effects of nano-structures on boiling of liquids.
- Characterization of heat flux during linear and rapid boundary heating in nano-confinements.
- Numerical standardization of thermally stratified co-axial jet flow parameters.

TEACHING AND MENTORING EXPERIENCE

Graduate Teaching Assistant   **August 2018-Present**
Department of Mechanical Engineering
Marquette University
- Prepared and taught several lectures on heat transfer for junior level undergraduates.
- Serving as the grader for fluid mechanics and heat transfer courses designed for junior level undergraduates.

Graduate Assistant   **March 2016-August 2017**
Department of Mechanical Engineering
Bangladesh University of Engineering & Technology (BUET)
- Mentored two separate groups totaling seven undergraduate seniors in their undergraduate thesis work. One group worked on linear heating in nano-confinement and the other group worked on numerically modeling a thermally stratified co-axial jet.
- Guided these groups in preparation of their research findings.

PROFESSIONAL EXPERIENCE

Operation Engineer (Export)   **2016**
PRAN-RFL Group, Dhaka, Bangladesh
- Worked on the "Automatic Conveyor Control System in Production Line" project actively (Hardware and Software)
- Active member of the operation and maintenance team for Injectoin and Blow moulding machines.

Maintenance Engineer (Intern)   **2016**
Khulna Power Company LTD. (KPCL), Khulna, Bangladesh
- Hands on experience of working with large diesel and HFO based power plant

TECHNICAL SKILLS

Programming language and Mathematical packages: C/C++, Python, Fortran, Matlab, gnuplot, bash.

CAD/Engineering: AutoCAD, SolidWorks, Origin Pro, Tecplot , OpenFOAM, Converge CFD, Ansys, Comsol Multiphysics.

Other: Linux, Mac OS, Windows OS, LaTeX etc.

PUBLICATIONS

- **K. M.Mukut**, S. P. Roy, (2020). "Effect of O_2 concentration in ambient mixture and multiphase radiation on pollutant formation in ECN spray-A", Combustion Theory and Modelling, 1-24

- M. N. Hasan, S. M. Shavik, K. F. Rabbi, **K.M.Mukut**, and M. M. Alam, (2018). "Thermal transport during thin-film argon evaporation over nanostructured platinum surface: A molecular dynamics study." Proceedings of the Institution of Mechanical Engineers, Part N: Journal of Nanomaterials, Nanoengineering and Nanosystems.

- M. N. Hasan, S. M. Shavik, **K.M.Mukut**, K. F. Rabbi and A. H. M. Faisal, (2018) "Atomistic modelling of thin film argon evaporation over different solid surfaces at different wetting conditions", IET Micro Nano Letters, 13(3),351-356.

- M. N. Hasan, S. M. Shavik, K. F. Rabbi, **K. M.Mukut**, and A. Morshed, (2017). "Phase Change Characteristics of Ultra-Thin Liquid Argon Film over different Flat Substrates at High Wall Superheat for Hydrophilic/Hydrophobic Wetting Condition: A Non-Equilibrium Molecular Dynamics Study", Journal Of Chemical Engineering, 29(1), 49-55.

- K.F. Rabbi, S.I. Tamim, A.H.M Faisal, **K. M.Mukut**, M.N. Hasan, (2017) "A molecular dynamics study on thin film liquid boiling characteristics under rapid linear boundary heating: Effect of liquid film thickness", AIP Conference Proceedings 1851 (1), 020102.

- M.N. Hasan, K.F. Rabbi, **K. M.Mukut**, S.I. Tamim and A.H.M Faisal, (2017) "Nano scale dynamics of bubble nucleation in confined liquid subjected to rapid cooling: Effect of solid-liquid interfacial wettability", AIP Conference Proceedings 1851 (1), 020100.

- **K. M.Mukut**, M.N. Hasan, K. F. Rabbi, Y. Mitsutake, M. Monde, (submitted) "Molecular Dynamic Study on Nanoscale Phase Change Characteristics of Thin Film Liquid Argon during Ultrafast Linear Boundary Heating"

CONFERENCE PRESENTATIONS

ORAL PRESENTATION

- **K. M.Mukut**, S. P. Roy, (2019) "An Investigation of Soot Evolution in High-pressure Spray Combustion",11th U.S. National Combustion Meeting , Pasadena, CA

- M. N. Hasan,**K. M.Mukut**, K.F. Rabbi, M. Alam, Y. Mitsutake, M. Monde, (2018) "Atomistic and Macroscopic Perspectives of Thin Film Boiling", 10th International Conference on Boiling and Condensation Heat Transfer, Nagasaki, Japan.

- **K. M.Mukut**, S. P. Roy, (2018) "A Sensitivity Study on Soot and NO_x Formation in High Pressure Combustion System", CSSCI 2018 Spring Technical Meeting, Minneapolis, MN

- **K. M.Mukut**, M. N. Hasan, M. T. Ali (2017) "Numerical Study of Turbulent Co-Axial Free Jets", ICMEAS 2017, Dhaka, Bangladesh.

POSTER PRESENTATION

- **K. M.Mukut**, S. P. Roy, S.F. Fernandez, D.C. Haworth, M. Modest, (2018) "Soot and Radiation Models in Prediction of Pollutant Formation from Practical Combustion Scenarios", 10th International Aerosol Conference, ST. Louis, MO.

HONORS AND AWARD

Best Poster Award   **2018**
In annual graduate poster exhibition at Marquette University
More than 60 graduate student participated in the exhibition

Dean's List Scholarship   **2011-2012**
In my freshman year in BUET
Awarded to the top three students in each year of undergraduate study.

PROJECTS & TRAINING

- An interactive training session on General Flow Modeling using CONVERGE CFD software at Madison, Wisconsin (2018)
- A week long training on OpenFOAM, an opensource CFD software organized by CFD Direct. (2017)
- Undergraduate 3rd Year Project: Autonomous Robotic Waitress System in a Cafeteria(2014)

REFERENCES

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Department of Mechanical Engineering
Bangladesh University of Engineering & Tech.
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