ARASH JALIL-KHABBAZI
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Curriculum Vitae

2022-09-30

EDUCATION

The University of British Columbia (UBC), Kelowna, BC, Canada — *May 2021 – Present*

- M.A.Sc. in Mechanical Engineering, Thermofluids
  GPA: 4.3/4.3 (94.75/100)
  Thesis: *Numerical and analytical study of green hydrogen integration into the existing grids for net-zero GHG emissions: Case study in BC, Canada*
  Adviser: Sunny-Ri Li

The University of Tabriz, Tabriz, EA, Iran — *Sep 2016 – Aug 2020*

- B.Sc. in Mechanical Engineering, Thermofluids
  GPA: 19.12/20 (95.6/100) (4.0/4.0), *Rank: 2^{nd}/124*
  Thesis: Thermodynamic and exergy analysis of Kalina cycle system 11 (KCS11) and a new type with three pressure levels (20/20)
  Adviser: Seyed-Mohammad Seyed-Mahmoudi

Shahid Madani I (NODET), Tabriz, Iran — *Sep 2012 – Sep 2016*

- High School, Mathematics and Physics
  GPA: 19.55/20 (97.75/100)

RESEARCH

A. Jalil Khabbazi and R. Li, "Numerical and analytical study of green hydrogen integration into the existing grids for net-zero GHG emissions and for heating homes: Case study in BC, Canada", To be submitted.

- Summary: Studying the integration of generated green hydrogen from solar cells and wind farms into the existing grids from CFD and thermodynamics insight. It is expected that this approach will lower GHG emissions considerably. A multi-species approach through different equations of state (EoS) and mixing/combining rules is conducted. For the purpose of numerical simulation, ANSYS Fluent is used, and the multi-species codes are developed and compiled separately in C/C++.

A. Jalil Khabbazi and S. Seyed Mahmoudi, "Thermodynamic and exergy analysis of Kalina cycle system 11 (KCS11) and two other types with three pressure levels", Undergraduate, University of Tabriz, 2020., In Persian, *(EES codes and results)*.

- Summary: Comparing the efficiency of Kalina cycle system 11 (KCS11) and Kalina cycle system 111 (KCS111) based on different decision variables. The results were compared with some benchmarks in the literature. From a thermodynamics perspective, and apart from KCS111's complex configuration and high costs, it is more efficient than the base cycle, KCS11. *(+more)*

PRESENTATION

A. Khabbazi, R. Li and J. Quinn, "Green Hydrogen Supply to Urban Infrastructure and Buildings through Blending into the Existing Grid", in Conference Abstract. Part of the Proceedings of the Canadian Society for Mechanical Engineering (CSME) International Congress 2022., Edmonton, AB, Canada, p. 1., *(Link)*.

HONORS & AWARDS

- The Best Presentation Award at CSME 2022 International Congress, *(Certificate)* — *CSME, 2022*
- Graduate Research Scholarship, 3,000 CAD — *UBC, 2022*
- Graduate Dean's Entrance Scholarship, 5,000 CAD — *UBC, 2021*
- Fully funded graduate student in Mechanical Engineering, 26,000 CAD — *UBC, 2021*
- Merit-based admission to M.Sc. studies from distinguished universities of Iran including, Sharif University of Technology, University of Tehran, University of Tabriz. — *M.Sc., 2020*
- 2^{nd} place among 124 B.Sc. students of Mechanical Engineering — *UofTabriz, 2020*

TEACHING EXPERIENCE

Teaching Assistant, UBC

- APSC172 | Engineering Analysis I, *Role: Tutorial instructor* — *Fall'21, Fall'22*
- ENGR385 | Heat Transfer Applications, *Role: Lab instructor* — *Winter'22, Winter'23*
- ENGR310 | Fluid Mechanics II, *Role: Lab instructor* — *Fall'21*

Teaching Assistant, UofTabriz

- Thermodynamics II, *Role: Course support* — *Winter'20*

- Computer Programming (C/C++), *Role: Head tutorial instructor* *Fall'18, Winter'19, Fall'19*

TEST SCORE

- TOEFL 107/120 (W:28, S:24, R:28, L:27), obtained in 2020
- GRE 313/340 (W:4, Q:166, V:147), obtained in 2020

SKILLS

- Technical Software: ANSYS Fluent, OpenFOAM, Fluent Meshing, Tecplot, Paraview, Gmsh, CATIA
- Programming: Python, C/C++, Matlab, EES, HTML, Git
- Frameworks: NumPy, Pandas, SKlearn, SciPy, Matplotlib, Seaborn
- System and computation: Linux, High Performance Computing (HPC)

SELECTED COURSES

- Thermofluids

  Multi-phase Flows *(A+)* | Directed Studies *(A+)* | Heat Transfer I *(A+)* | Fluid Mechanics I&II *(A+)* | Thermodynamics I&II *(A+)* | Refrigeration Systems *(A+)* | Power Plants *(A+)* | Turbulence *(Winter 2023)*

- Numerical Analysis

  Computational Fluid Dynamics *(A+)* | Fundamentals of Computational Fluid Dynamics *(A+)* | Numerical Computations *(A+)*

- Computers and Systems

  Applied Machine Learning *(Fall 2022)*

COURSE PROJECT

UBC:

- *Directed Studies:* Developing a novel C/C++ code, for compiling to ANSYS Fluent, for Soave-Redlich-Kwong (SRK) Equation of state (EoS) embedded with Van der Waals mixing rules for multi-species mixtures. Some parts of this course's codes were implemented into the MASc thesis *(C/C++ code sample)*.
- *CFD:* Carrying out several Python-based mini-projects such as Wave-convection-inviscid-medium, 2D-flow-square-duct, and Steady-state-temperature-distribution as well as OpenFOAM-based ones, including 2D-lid-driven-cavity-flow, Turbulent-flow-backwards-facing-step, Converging-diverging-nozzle, to name but a few *(Python and OpenFOAM codes)*.
- *Multi-phase Flows:* Studying the linear instability of 2-D inviscid liquid sheets through the representation of results in Matlab. The derivation of dispersion relation for both anti-symmetrical and axi-symmetrical disturbances was carried out, and the instability limits and instability growth rate was also studied.
- *Applied Machine Learning:* Developing classification algorithms for sorting through raw images (Fall'22).

UofTabriz:

- *Heat Transfer I:* Simulation of convection and conduction heat transfer in a section of co/counter-current double pipe heat exchanger with periodic BCs, via ANSYS Fluent and ANSYS Meshing.
- *Fundamentals of CFD:* Steady-state 2-D and 3-D simulation of flow across a fin with varying BCs, via ANSYS Fluent and Gambit.
- *Mechanical Parts Desgin I:* Design, simulation, and fabrication of an electromechanical lift, via CATIA, C++, ANSYS Mechanical.
- *Refrigeration Systems:* Pinch point analysis of several zeotropic refrigerants, via ANSYS Fluent and Matlab NIST REFPROP Database.
- *Design of Mechanisms:* Simulation and analysis of a 4-DoF mechanism in a space telescope's base, via EES and Adams software.

Coursera:

- *Supervised Machine Learning*, certificate of Deep learning.AI, *in 33 hours*, *(Certificate)*
- *Introduction to Data Science in Python*, from U. of Michigan, *in 31 hours*, *(Certificate)*
- *Applied Plotting & Data Representation in Python*, from U. of Michigan, *in 21 hours*, *(Python codes)*, *(Certificate)*
- *Python Data Structures*, from U. of Michigan, *in 19 hours*, *(Certificate)*

REFERENCES

Professor Sunny-Ri Li (Advisor)
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The University of British Columbia
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Professor Joshua Brinkerhoff (Committee Member)
School of Engineering
The University of British Columbia
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Professor Mir Mohammad Ettefagh (Instructor)
Mechanical Engineering Department
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