Johannes Köhler

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Mechanical Engineer with 5 years professional engineering experience. In the last 2.5 years, focused on thermal systems, heat transfer and electronics cooling projects. Researcher for the Air Conditioning and Refrigeration Center developing new technologies for HVAC and Refrigeration. Recent research includes condensation enhancements for low-GWP refrigerants, and electronics cooling with dielectric fluids and with evaporative technologies. Inventions include patent #20190166944, "Mechanical shock abatement system incorporating sacrificial systems".

SKILLS

ANSYS, Autodesk Inventor, CFD, COMSOL, Data Center Cooling, EES, Electronics Cooling, Fluent, Heat Transfer, HVAC, Icepak, Instrumentation, Labview, Matlab, Python, Refrigeration, Thermal Management, Thermal Systems, Two-phase simulations.

RECENT EXPERIENCE

Graduate Research Assistant **-** University of Illinois at Urbana-Champaign at Champaign, IL **Jun. 2019 - present**

Assistant to Nenad Miljkovic, Ph. D., at the ***Energy Transport Research Lab,*** for heat transfer and thermal systems research projects for the refrigeration, HVAC, power electronics and aerospace industries. Tasks include system modeling and design, experimentation and numerical simulations of heat transfer and fluid dynamics. Some projects include:

- Characterized refrigerant internal flow condensation enhancements for novel internal tube surfaces and found improvements of 10%, available for scaled manufacturing and heat exchanger size reductions. Presented to the Air Conditioning and Refrigeration Center.
- Implemented a novel additively manufactured manifold for thermal management of a planar PCB transformer using dielectric flow. Showed 50x reduction in thermal resistance from an air-cooled alternative, enabling high temperature heat recovery and improving reliability. Presented to the Center for Power Optimization of Electro-Thermal Systems.
- Manager of the team responsible for the thermal outputs of an IGBT health monitoring system in a traction reliability application. Developed a 300x more time-efficient way to compute (on-site) junction temperature, compared to approaches found in literature, in order to predict failure due to thermal cycles and calculate damage accumulation.

Intern **-** Nokia Bell Labs at New Providence, NJ **Jun. 2021 – August 2021**

Summer internship at the Efficient Energy Transport division. Developed a liquid-vapor CFD model for a novel evaporator microchannel tailored for passive two-phase cooling systems of data centers. The technology is set to meet the industry demands of increasing rack density and high temperature heat recovery.

EDUCATION

University of Illinois at Urbana-Champaign **Jun. 2019 -** Expected Dec. 2021

- Master of Science in Mechanical Engineering (program ranked #5 in the US) GPA: 4.0/4.0
  400 LVL Courses: Design of Thermal Systems, Int. Heat Transfer, Ind. Control Systems, Refrigeration Syst. & Cryogenics.
  500 LVL Courses: Convective Heat Transfer, Comp. Mod. of Industrial Transport Processes, Thermal Systems.

Universidad del Valle de Guatemala *Jan. 2013-Dec. 2017*

- Bachelor of Science in Mechanical Engineering GPA: 4.0/4.0
  - Summa Cum Laude, "Francisco Nieves Calvo" prize and Honor Mention in Thesis Project.
- Projects: ethanol-powered ultra-efficient vehicle, design of a CubeSat satellite structure for component assembly.

ADDITIONAL EXPERIENCE

Product Development Engineer **Jan. 2017 – May. 2019**

Titon Ideas | Guatemala City, GT

Designed, prototyped, tested and patented a disruptive impact attenuation technology for hard hats. Lead the product development team and reduced the maximum impact transmission force by up to 40% in standardized tests. Pitched the technology to multiple US companies as representative engineer of the product innovation startup.

Consultant (Previously Analyst) **Feb 2015 – Feb. 2017**

Mercados Eléctricos de Mesoamérica, S. A. | Guatemala City, GT

Consultant for sale and purchase of electrical energy in the Guatemalan market. Provided services for power generators, brokers, and great users. Developed analysis tools and improved company efficiency in operations.

REFERENCES

Available on request.