

KAUSTHUBHARAM

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AREAS OF INTEREST

Li-ion batteries, Computational mechanics, Constitutive modelling, Heat transfer, Micro/nanoscale fabrication, functional polymers

EDUCATION

Seoul National University Sept 2021 - Aug 2023
Master of Science CGPA: 3.90/4.0
Department of Mechanical Engineering
Thesis: Untethered actuation of electroactive polymer actuator for soft robotics

National Institute of Technology Karnataka, Surathkal Aug 2015 - May 2019
Bachelor of Technology CGPA: 8.29/10
Department of Mechanical Engineering

PUBLICATIONS

Kausthubharam, S Kim, S-H Ahn. *Field controlled micro robotic fish*
Science Robotics (SCI, IF 23.75) (Submitted)

Kausthubharam, Koorata PK, S Panchal, et al. *Passive air-cooled thermal management solutions for large sized LiFePO₄ /Graphite battery*
Int. J. Heat Mass Transf. (SCI, IF 5.431) (Submitted)

Kausthubharam, J-K Heo, S-H Ahn, et al. *Scale effects on the fabrication and control of remotely-powered microactuators*
Int J Robot. Res. (SCI, IF 8.75) (Under review)

Kausthubharam, Koorata PK, S Panchal, et al. *An efficient liquid cooling strategy based on mini-channel cold plates for large-sized LiFePO₄ pouch cell*
Appl. Therm. Eng. (SCI, IF 6.46) (Under review)

Kausthubharam, Koorata PK, S Panchal, R Fraser, M Fowler. *Combined influence of concentration-dependent properties, local deformation and boundary confinement on the migration of Li-ions in low-expansion electrode particle during lithiation*
J Energy Storage (SCI, IF 8.09)

Kausthubharam, Koorata PK, Chandrasekaran N. *Numerical investigation of cooling performance of a novel air-cooled thermal management system for cylindrical Li-ion battery module*
Appl Therm Eng (SCI, IF 6.465)

Kausthubharam, Koorata PK, Chandrasekaran N. *Impact of mechanical stiffening and softening on the spatial distribution of lithium ions in spherical electrode particle under galvanostatic charging*
Int J Energy Res (SCI, IF 5.162)

PROJECTS

Ionic polymer metal composite (IPMC) based active micromixer Sept 2022 - Present

- IPMC inserted micromixer is fabricated using oxygen plasma bonding and stereolithography.
- Performance of micromixer is investigated through customised image processing algorithm.

Dual actuation and bistable Shape memory alloy-based microactuator Mar 2022 - Feb 2023

- Design optimisation is carried out by static structural analysis through ANSYS.
- The patterned actuator was fabricated by employing Focused-ion beam milling.
- The microactuator could manipulate biological species of size 10-25um.

Auto-FOD (Foreign Object Damage) Detection System Sept 2021 - Dec 2021

- Developed automated FOD detecting method by implementing Mask R-CNN algorithm.
- The trained algorithm has detection rate of 100 % for FO of size above 0.8cm.

UNDERGRADUATE PROJECTS

Design optimization of electro-thermally actuated Microgripper Sept 2016 - Dec 2016

- Designed thermally actuated microgripper and compared in-plane and out-off-plane motion of gripping arms.
- The optimised design had highly decoupled acuation with just 8 % out-of-plane movement.
- Temperature at end of gripping arms was maintained well below 310K.

Two-stage micro-impinging stream reactors Sept 2018 - May 2019

- Investigated the mixing efficiency of the proposed micromixer for various functional parameters like velocity ratio and first-stage junction angle.
- Maximum mixing efficiency is obtained for junction angle of 180 deg.

TECHNICAL STRENGTHS

Modeling & Simulation Languages	FUSION 360, SOLIDWORKS, ANSYS (Fluent & Structures), COMSOL MATLAB, C++, Python
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PAST EXPERIENCE

National Institute of Technology Karnataka, Surathkal, IN Jan 2020 - Feb 2021
Research Assistant

Mahindra and Mahindra Ltd, Pune, IN Aug 2019 - Dec 2019
Graduate Engineering Trainee

Hindustan Aeronautics Ltd, Bangalore, IN May 2017 - Jun 2017
Industrial Trainee

CONFERENCES

Design and control of Electroactive polymer-based actuator using remote electric field
International conference

Kausthubharam and S-H. Ahn, Proceedings of the 9th International Conference on Manufacturing, Machine Design and Tribology, Jeju, KR.

Reversible Ion Implantation of Electroactive Polymers by Application of Local Electric Field

Domestic conference

Kausthubharam and S-H. Ahn, KSPE 2023 Spring Conference, Ramada Plaza, Jeju, KR.

Ionic Polymer Metal Composite (IPMC) actuated hybrid micromixer for mixing efficiency enhancement

Domestic conference

Sophia Castro, Kausthubharam and S-H. Ahn, KSPE 2023 Spring Conference, Ramada Plaza, Jeju, KR.

Realization of glass surface structure color through microscale hydrogel printing

Domestic conference

W-J. Kim, J-W. Park, Y.J. Quan, Kausthubharam and S-H. Ahn, KSPE 2022 Fall Conference, EXCO, Daegu, KR.

Electroactive Polymer Actuator Using Electrolyte Solution and Remote Electric Field

Domestic conference

Kausthubharam and S-H. Ahn, KSPE 2022 Fall Conference, EXCO, Daegu, KR.