Ranjithvel M

M.Tech. · Metallurgical and Materials Engineering

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Education

Indian Institute of Technology Madras (Grade:9.57/10) — *Chennai, TN, India*

Master of Technology in Metallurgical and Materials Engineering — *Jul. 2022 - Jun. 2024*

PSG College of Technology — *Coimbatore, TN, India*

Bachelor of Engineering in Metallurgical Engineering — *Aug. 2018 - Apr. 2021*

Skills

Tools Magnetron sputtering, SEM, XRD, UV-VIS spectra, Potentiostat

Programming Python, MATLAB and MTex, LaTeX

Languages English, Tamil, Hindi

Experience

Electronic Materials and Thin Films lab, IIT Madras — *Chennai, TN, India*

Graduate student researcher — *Jul. 2023 - Jun. 2024*

- Incharge for the potentiostat (Autolab PGSTAT204) and Four Probe system (Jandel RM3000+).
- Collaborated with Material design lab in IIT Madras to fabricate thin films by using magnetron sputtering (ATS-500, HHV - Advanced).

Nouveaux Industries Pvt. Ltd., Kangeyam. — *Kankegam, TN, India*

Intern — *Jan. 2021 - Apr. 2021*

- Gained hands-on experience in electrode manufacturing, from wire straightening to baking flux-coated electrodes.
- Proposed and implemented the use Taguchi's L9 method for the design of experiments which reduced the number of trials by 75%.

Indian Institute of Technology Madras — *Chennai, TN, India*

Teaching Assistant — *Aug. 2022 - Jun. 2024*

- TA for Electronic Materials, Devices and Fabrication (MM5017) Course
- Facilitated students in learning by conducting tutorial sessions.
- Developed MATLAB programs to generate practice problems.

Patent and Publication

Indian Patent Application: 202441060769 (submitted) — *Patent*

Ranjithvel M, Sudha A, and Parasuraman Swaminathan. Electrochromic device based on Vanadium oxide active electrode and salt-based electrolyte — *Aug. 2024*

ACS materials surfaces (To be submitted) — *Journal*

Ranjithvel M, Sudha A, and Parasuraman Swaminathan. Study of salt-based electrolytes on the electrochromic behavior of sputtered vanadium pentoxide films — *JAug. 2024*

Presentation

XXII International Workshop on Physics of Semiconductor Devices (IWPSD 2023) — *Chennai, TN, India*

Magnetron sputtered vanadium oxide for electrochromic applications, (poster presentation) — *Jan. 2024*

- Explained the design of experiments for the deposited films and the optimised parameters.
- Highlighted the macroporous nanosheet structure of the V_2O_5 films.

Scholastic achievements

2024 **AIR 14,** (All India Rank) Graduate Aptitude Test in Engineering 2024, Metallurgical Engineering — *GATE*

2022 **AIR 124,** (All India Rank) Graduate Aptitude Test in Engineering 2022, Metallurgical Engineering — *GATE*

Projects

Extended Project (ongoing) — *IITM*

Feasibility of Vanadium oxide-based films for sensor applications, Guide: Prof. Parasuraman Swaminathan — *Jan. 2024*

- Partially successful in creating the macroporous nanosheets without annealing.
- Also deposited the films in flexible substrates.

Master Thesis — *IITM*

Vanadium oxide-based electrochromic devices using salt electrolytes for displays, Guide: Prof. Parasuraman Swaminathan — *Jun. 2023 - Jul. 2024*

- Presented the findings using salt-electrolytes in oral presentation in Amalgam '24
- Investigated the compatibility of films deposited by sputtering with different electrolytes.
- Successfully fabricated and operated the solid-state devices using different counter electrodes (WO_3, and NiO).
- Used FTO as a counter electrode that had been unsuccessful before.

B.E. Project — *PSG Tech*

Development of ENi-1 and ENiCu-7 welding electrodes indigenously, Guide: Dr. Suresh Srinivasan — *Jan. 2021 - Apr. 2021*

- Proposed the use of combination of Titanium and Aluminium(low quantity) as deoxidizers in flux coating which reduces the porosity by 50%.

Course Project — *ID6106*

Life cycle assessment of Lithium NMC oxide battery packs used in EVs, Guide: Prof. Tiju Thomas — *Mar. 2023*

- Explored various indicators and techniques to conduct LCA, a "cradle-to-grave" life of products.
- Simultaneously, learned about the necessary raw materials and their environmental effects.

Project I — *PSG Tech*

Hardfacing of Ni-Co alloys, Guide: Dr. Suresh Srinivasan — *Jul 2020 - Dec. 2020*

- Conducted thorough literature survey & Proposed the use of pulsed plasma arc welding with stellite-6 as the suitable material.

External courses

NPTEL course on Electronic properties of materials: Computational approach — *Online*

Prof. Somnath Bhowmick, Dept. of MSE, IIT Kanpur — *Aug. 2023 - Oct. 2023*

GIAN course on Metal oxide semiconductors: Theory and Applications — *IITM*

Prof. Celso M. Aldao, Dept. of Physics, University of Mar del Plata, Argentina. — *Dec. 2022*

NPTEL course on Transport phenomena in Materials — *Online*

Dr. Gandham Phanikumar, Dept. of MME, IIT Madras. — *Jul 2019 - Oct. 2019*

Position of responsibility

M.Tech.(III semester) — *IITM*

Class representative — *Jan. 2023 - Apr. 2023*

- Facilitated effective communication between students and Class Advisor.
- Successfully managed the creation and submission of Annual report(2022) to the Institute Director.

Wootz ed.12 — *PSG Tech*

Coordinator — *Feb. 2021 - Mar. 2021*

- Proposed and created the event "Mr/Ms.Engineer"
- With a Team of four, created a quiz event on the theme "Materials Everywhere".

National Service Scheme(NSS) — *PSG Tech*

Volunteer — *Jul. 2017 - Apr. 2019*

- Participated in clean school drive in a special NSS camp.
- Taught school students how to use computer for learning.

Referees

List of Referees

- Prof. Dr. Parasuraman Swaminathan, Professor, Electronic Materials and Thin Film Lab, IITM
  Email: swamnthn@iitm.ac.in
- Dr. Dr. Suresh Srinivasan, Professor and former General Manager of CoE Welding, PSG Tech
  Email: drsuresh.srinivasan@gmail.com

Workshops attended

2024	**Materials Database**, workshop by Springer at Amalgam ’24	*IITM*
2024	**Material Characterization**, workshop by Zeiss & Joel company at Amalgam 2024	*IITM*
2023	**Computational Thermodynamics**, workshop at Amalgam 2023	*IITM*
2023	**Using MATLAB with python**, webinar by Mathworks	*Online*
2019	**Entrepreneurship, Thermal processing of metals & Cast iron in industries**, workshop at Metmat 23.0	*GCE*
2019	**Failure analysis of Engineering components**, workshop by SMSE at Anna University	*CEG*
2018	**Challenges in welding of recent materials and quality inspection**, workshop at WOOTZ’ 9	*PSG Tech*

Interests & Activities

Co-curricular

2024	**2nd Place**, ASM Metallography contest, Amalgam ’24	*IITM*
2023	**2nd place**, Prof. Vasudevan Quiz, Amalgam ’23	*IITM*
2020	**1st place**, Technical quiz, Metmat 20.0	*GCE*
2020	**2nd place**, Presentation, Metmat 20.0	*GCE*
2019	**1st place**, The Brainy Bunch – General, Metmat 19.0	*GCE*
2018	**1st place**, “Mr/Ms. Engineer”, WOOTZ’ 9	*PSG Tech*
2018	**2nd place**, Castology, WOOTZ’ 9	*PSG Tech*

Extracurricular

2024	**3rd Place**, Javelin throw, Intramurals	*IITM*
2023	**2nd Place**, Javelin throw, Intramurals	*IITM*
2023	**2nd Place**, Shotput, Intramurals	*IITM*
2022	**Participated**, Run for Unity (5KM Marathon) in SAMANVAY ’22	*IITM*