

# Ranjithvel M

M.TECH. · METALLURGICAL AND MATERIALS ENGINEERING

Tiruchengode, TN, India

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## Education

### Indian Institute of Technology Madras (Grade:9.57/10)

MASTER OF TECHNOLOGY IN METALLURGICAL AND MATERIALS ENGINEERING

Chennai, TN, India

Jul. 2022 - Jun. 2024

### PSG College of Technology

BACHELOR OF ENGINEERING IN METALLURGICAL ENGINEERING

Coimbatore, TN, India

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

GRADUATE STUDENT RESEARCHER

Chennai, TN, India

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.

INTERN

Kankegam, TN, India

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

TEACHING ASSISTANT

Chennai, TN, India

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)

RANJITHVEL M, SUDHA A, AND PARASURAMAN SWAMINATHAN. ELECTROCHROMIC DEVICE BASED ON VANADIUM OXIDE ACTIVE ELECTRODE AND SALT-BASED ELECTROLYTE

Patent

Aug. 2024

### ACS materials surfaces (To be submitted)

RANJITHVEL M, SUDHA A, AND PARASURAMAN SWAMINATHAN. STUDY OF SALT-BASED ELECTROLYTES ON THE ELECTROCHROMIC BEHAVIOR OF SPUTTERED VANADIUM PENTOXIDE FILMS

Journal

JAUG. 2024

## Presentation

### XXII International Workshop on Physics of Semiconductor Devices (IWPSD 2023)

MAGNETRON SPUTTERED VANADIUM OXIDE FOR ELECTROCHROMIC APPLICATIONS, (POSTER PRESENTATION)

Chennai, TN, India

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

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## 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 ( $\text{WO}_3$ , and  $\text{NiO}$ ).
- 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

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## 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

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## 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

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## 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

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

## Interests & Activities

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### CO-CURRICULAR

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

### EXTRACURRICULAR

2024	<b>3rd Place</b> , Javelin throw, Intramurals	IITM
2023	<b>2nd Place</b> , Javelin throw, Intramurals	IITM
2023	<b>2nd Place</b> , Shotput, Intramurals	IITM
2022	<b>Participated</b> , Run for Unity (5KM Marathon) in SAMANVAY '22	IITM