# ASHUTOSH SHIROLE

Rankala road, Kolhapur, 416012 | ashu11121315@gmail.com | Website |
ORCID ID: 0000-0001-7588-6959 | LinkedIn

## EDUCATION

**B.Tech in Mechanical Engineering** August 2018 – September 2021

*Shivaji University* Maharashtra, India
**CGPA**: 8.47/10 (Distinction) (**10th rank/360** students)
**Thesis title**: Flexibility assessment of district energy system for higher VRE shares using FlexTool
**Major courses**: Power plant engineering, Heat and mass transfer, Engineering thermodynamics, Fluid mechanics

**Diploma in Mechanical Engineering** June 2015 – May 2018

*Maharashtra State Board of Technical Education* Maharashtra, India
**Percentage**: **90.71** (Distinction) (**Top 1% at Board**)
**Thesis title**: Design and development of multipurpose air compressor
**Major courses**: Renewable energy sources and management, Thermal engineering, Theory of machines

## PUBLICATIONS

| **Research papers** | **Citations** |
|---|---|
| **Shirole, A**., Wagh, M., Kulkarni, V. and Patil, P., 2023. Short-term energy scenario of district energy system using optimised renewable energy mix with and without energy storage. Results in Engineering, p.101017. https://doi.org/10.1016/j.rineng.2023.101017 [**Impact Factor: 5]** | **10** |
| **Shirole, A**., Wagh, M., & Kulkarni, V. (2021). Thermal Performance Comparison of Parabolic Trough Collector (PTC) Using Various Nanofluids. International Journal of Renewable Energy Development, 10(4), 875-889. https://doi.org/10.14710/ijred.2021.33801 [**Impact Factor: 2.5]** | **3** |
| **Shirole, A**. (2020). Status of Concentrated Solar Power in India. International Research Journal of Engineering and Technology, 7 (10) [View, Peer reviewed journal] | **N/A** |

## PROJECTS

### Short-term energy scenario of district energy system using optimised renewable energy mix with and without energy storage

- Developed multi-objective, multi-node optimisation model for the district energy system and conducted combined analysis to reduce total system cost, carbon footprint and meet flexibility demand.
- Analysed multiple scenarios to identify an optimal capacity expansion plan, located flexibility issues in future energy grid and suggested possible alternatives to reduce the same.
- Performed sensitivity analysis to identify renewable energy penetration capacity of district energy system and also studied tech-economic effect of the same.

### Flexibility assessment of district energy system for higher variable renewable energy shares using FlexTool

- Formed a multi-node model of district energy system to locate detailed flexibility shortages in future district energy system
- Successfully satisfied 25% and 50% of district's energy demand by 2025 and 2030 year with the help of locally available renewable energy sources such as PV and wind, biogas, hydro energy and waste heat recovery.
- Analysed low-carbon, low-cost hourly energy dispatch using flexibility indicators like inertia, curtailment and loss of load for multiple scenarios to satisfy flexibility constraints and ensure reliability of future energy grid.
- Estimated shadow values for considered scenarios which indicate further possible cost reductions beyond optimal solution

### Thermal Performance Comparison of Parabolic Trough Collector (PTC) Using Various Nanofluids

- Calculated thermal performances for metallic as well as carbon nanofluids by considering heat transfer equations, thermodynamic properties of nanofluid and pumping power
- Analysed behaviour of nanofluid flows using various dimensionless numbers and identified the variableswhich influence the most for 0 – 10% range of nanofluid concentration
- Predicted technical and economic viability of technology for a range of nanofluid concentration

### Multipurpose air compressor [Industrial sponsored project]

- Designed and assembled multipurpose air compressor to serve multiple operations simultaneously in the absence of grid power, the system can operate pneumatic tools, grinding operations, generate electricity, and charge battery.
- Considering the mobility and multi-functionality, the device benefitted to industry economically.

## PROFESSIONAL EXPERIENCE

**Tata Consultancy Services Ltd** Pune, Maharashtra
*Systems engineer* September 2021- Present

- Worked for Woodside Energy Ltd client to support and maintain oil and gas refinery production plant servers. This involves resolving application, data unavailability issues, debugging the application codes and updating process history database (PHD) using P2 Explorer and PSMI production tools.
- Import, clean, and filter the adaptive and raw plant operation data to be used by data analyst team for deriving KPIs (Key Performance Indicators).
- Analyse the data to provide quality datasets and insights to lead business-critical decisions.
- Analyse the user behaviour data to review targeting criteria and generate KPI report.
- Convert data into actionable items by predicting and modelling future outcomes.
- Recommend and implement ways to improve data reliability, efficiency and quality.

## INTERNSHIPS

**Internship at ARS Glass Tech Pvt. Ltd. Vadodara, Gujarat** Dec 2021 – March 2022

- Assisted in drawing and design of Scheffler dish solar collector
- Collaborated with a team from Goa Energy Development Agency (GEDA) which examined the performance of a Solar steam cooking system project at College of Military Engineering (CME) Kirkee Pune.
- Calculated multiple metrics related to the solar steam cooking system, such as steam generation capacity and possible number of meals which can be produced while considering solar irradiance at the site
- Prepared report on the above test and results

**Industrial Training at Lada Pumps Pvt. Ltd. in the area of foundry and pump assembly** May 2019 – June 2019

- Learned designing and simulation of casting models using SOLIDWORKS, Adstefan software, respectively.
- Observed and monitored the process flow in foundry industry from raw material to finished product.
- Checked the quality of casting products by performing multiple tests such as universal machine test for tensile strength and ultrasonic test for internal flaws.

**Industrial training at Shri Kriskna engineers, on machining shop** May 2017 – June 2017

- Introduced to CNC programming for finish machining of mechanical components such as pinion shafts, gear blanks, valve tappet threading shafts
- Learned the use of inspecting equipment for quality control of machined products.

## HONOURS AND AWARDS

- **Merit Scholarship** worth AUD 450 by Shivaji University (2019-2020)
- **Tenth rank out 360 students** in B.Tech mechanical engineering at Shivaji University, Kolhapur, 2021

- **First prize** in **National level paper presentation** competition at Tatyasaheb Kore Institute of Engineering and Technology – Topic presented – New advances in renewable energy, 2021
- **First prize** at **Start-up Time event** organized by Electronics & Telecommunication Engineering department, Department of technology, Shivaji University, Kolhapur, 2019
- **Runner-up prize** in **National level paper presentation** competition at Dr. Bapuji Salunkhe institute of engineering and technology - Topic presented – Eco-friendly fuels, 2018
- **First rank** in **first year examination** conducted by Maharashtra state board of technical education at the Diploma College, 2015

## PROFESSIONAL MEMBERSHIPS

- Tata Power Club Enerji — May 2021- Present
- International Association of Hydrological Sciences — October 2022- Present
- Open Energy Modelling Initiative (openmod) — September 2023- Present

## EXTRA-CURRICULAR ACTIVITIES

- **Climate change and sustainable investing specialization by EDHEC Business School**

  Specialization contained four courses which provided comprehensive understanding of complex relationships between climate change, economy and finance. Also informed the tools to select policy approaches involved in the transition to a low carbon economy.

- **The Materiality of ESG Factors Specialization by University of Pennsylvania**

  Specialization constituted four courses that provided overview of various investment approaches that are governed by ESG factors, role of private players in combatting climate change and practices for creating a solid risk management plan.

- Global Energy and Climate Policy course by SOAS University of London
- **Energy and Flexibility Modelling** course by Imperial College London
- **Solar Energy Basics and System Design course by The State University of New York**
- Solar photovoltaic - Fundamentals, Technology and applications by **IIT Roorkee** [Received **Elite grade at exam**]
- Data Science for engineers, by **IIT Madras**
- **Volunteered** at **Student solar ambassadors workshop** organized globally by IIT Bombay on 2nd October 2019
- Participated in START-UP 2019 – A Hackathon organized at Rajiv Gandhi Government College, Himachal Pradesh

## SKILLS AND INTERESTS

**Software:** HOMER, Flextool, OSeMOSYS**,** QGIS, CATIA, Unigraphics NX, SOLIDWORKS, AUTOCAD

**Coding languages**: Python, R and R studio, SQL, HTML, CSS, AMPscript

**Languages**: English (C1), German (A1 Goethe certified), Hindi, Marathi, Sanskrit

**Interests**: Energy system modelling and optimization, Renewable energy integration, Energy policy, Climate finance