PRAVEEN RANGANATH PRABHAKAR

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ACADEMIC DETAILS

Academics	University	Year	GPA	
M.Sc.(Hons.) Chemistry	BITS Pilani	2014-2019	9.12/10	Top 1%
B.E.(Hons.) Chemical Engineering	BITS Pilani	2014-2019	9.12/10	Top 5%

RESEARCH INTERESTS

- Modelling & Simulations, Optimization, Fundamental properties, Theoretical Chemistry & Computational Chemistry.

PUBLICATIONS

- Acoustical and optical properties of binary liquid mixtures: A comparative study, Indian Journal of Chemistry, Vol. 57A, 920-925, July 2018 (link)

WORK EXPERIENCE

- **IIT Madras**, Project Associate, *(Apr'21-Jul'21)*:
    - Worked on the thermodynamic computation of chemical systems using quantitative modeling & numerical optimization techniques and compared the simulation results with the experimental observations.
- **HIVELOOP TECHNOLOGY PRIVATE LIMITED**, Analyst, *(Sep'19-Jul'20)*:
    - Used data analytics to optimize different processes and implemented various cost-cutting strategies.

THESIS - BITS Pilani

- **LINEAR STABILITY ANALYSIS OF TAYLOR-COUETTE FLOW AND LIQUID CURTAIN**
  (Guide: Dr.Rajagopal Vellingiri, Aug'18- Dec'18)
    - Performed the linear stability analysis of the Taylor-Couette flow for a Newtonian fluid and generated the eigenvalue spectrum computationally using Chebyshev spectral methods, and also validated it with literature data.
    - Further, formulated the eigenvalue problem for a viscoelastic fluid subjected to Taylor-Couette flow.
    - Carried out the linear stability analysis for the flow of liquid curtains and analyzed the stability of the system computationally by spectral methods & also analytically by a long wave asymptotic analysis.
    - Carried out a parametric study and studied the impact of different parameters like viscosity, gravity & surface tension on the flow of liquid curtains.

PROJECTS - BITS Pilani

- **DYNAMICS OF LIQUID JETS** (Study & Design Project)
  (Guide: Dr.Rajagopal Vellingiri, Aug'17- May'18)
    - Tackled the fluid flow problem of liquid jets involving both inviscid and viscous flows using the Navier-Stokes equation (PDE) & perturbation theory.
    - Performed the linear stability analysis & found the stable modes from the dispersion relation and was able to get an insight into the hydrodynamic stability of liquid jets.
    - Further, investigated the change in the liquid jet dynamics in the presence of an insoluble surfactant at the liquid jet interface.

- **MOLECULAR INTERACTION STUDIES BASED ON THERMOPHYSICAL PROPERTIES** (Design Project)
  (Guide: Dr.Ranjan Dey, Aug'16-Dec'16)
    - Studied the molecular interactions between liquid mixtures from the computations of ultrasonic velocity and refractive index.
    - Performed a comprehensive study on various predictive approaches for computing ultrasonic velocity & refractive index and evaluated their predictive capabilities against the experimental findings.
    - Measured the accuracy of predictions against experimental results using the parameter AAPD, (Absolute average percentage deviation) for over 80 binary liquid mixture systems. This research work was published in the Indian Journal of Chemistry in 2018.
- **STUDY OF THERMOPHYSICAL PROPERTIES OF LIQUID MIXTURES** (Study Project)
  (Guide: Dr.Ranjan Dey, Jan'16-May'16)
    - Predicted the ultrasonic velocity of binary, ternary and quaternary liquid mixtures using different approaches (Nomoto, Van Dael, Danusso, Zhang Junjie, CFT (Collision Factor Theory) and Free Length Theory).
    - Predicted the refractive index of binary, & ternary liquid mixtures using different approaches (Gladstone-Dale, Heller, Eykman, Oster, Newton and Arago-Biot).

INTERNSHIPS

- **CENTURY RAYON**, Research Intern, *(May'16-Jul'16)*:
    - Reduction of BOD (Biological oxygen demand): Provided recommendations for the reduction of Biological oxygen demand by gathering insights from research papers.

TEACHING EXPERIENCE

- Assisted professors by designing weekly tutorials, grading assignments & quizzes and tutoring students.
    - Teaching Assistant *(Jan'18-May'18)*:
      under Dr.Ranjan Dey for the course Thermodynamics.
    - Teaching Assistant *(Aug'17-Dec'17)*:
      under Dr.R.N.Behera for the course General Chemistry.
    - Teaching Assistant *(Aug'16-Dec'16)*:
      under Dr.Anil Kumar for the course Mathematics III - Differential Equations.

RELEVANT COURSES

- Physical Chemistry, Quantum Chemistry, Group Theory, Linear Algebra, Numerical Methods, Differential Equations, Advanced Calculus, Machine Learning (Coursera).

TECHNICAL SKILLS

- MATLAB, Wolfram Mathematica, LaTeX, Origin, COMSOL, C++.

ACADEMIC HONORS AND ACHIEVEMENTS

- Recipient of institute's merit scholarship for excellent performance in academics, (Awarded to the top 1% in a batch of 700 students, *Aug'18-Jun'19*).
- Won silver medal (second prize) in the poster presentation competition, Conference: Recent Trends in Chemistry, (Included over 40 participants from various universities, Bits Pilani - Goa, *Feb'17*).
- Semi-finalist in national chemical engineering quiz competition "CHEM-O-PHILIA", organized by IIT Bombay (Included representation from over 30 universities, *Mar'17*).

EXTRACURRICULAR ACTIVITIES

- **ABHIGYAAN**, *(Aug'16-Aug'17)*:
    - Volunteered in teaching basic Mathematics & English to the mess workers and children of mess workers.