Raghav Mittal

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Academic Qualifications

Year	Degree/Certificate	Institute	CPI/%
2014 - 2018	B.Tech in Materials Sc. & Engg.	Indian Institute of Technology, Kanpur	7.9/10
2013	Senior Secondary Certificate (CBSE)	Welham Boys School, Dehra Dun	96.8%
2011	Secondary (CBSE)	Welham Boys School, Dehra Dun	9.4/10

Work Experience

- **Associate Consultant, *M.N. Dastur & Co. (P) Ltd.***, *Kolkata* (*Jul '18 - ***Ongoing***)
  - Identified 17 operations improvement initiatives with a **potential of saving *$65 Mn* annually** for a Mexico based Integrated Steel Plant. Implemented and established 5 revised SoPs **saving the client *$21 Mn* annually**.
  - Conceptualized the Acid Gas Removal system on Aspen Hysys for **world's first Hyper-Scale CO_2 EOR enabling Petrochemicals Complex** for a UAE based Oil & Gas Company
  - Developed a predictive model for assisting Steel Melt Shop Ladle Furnace operators in exercising better control over the de-sulphurisation process. Potential cost savings from this model range from ***$5-6 Mn p.a.* for a 4.5 MTPA SMS.**
  - **Authored and presented 4 publications** at leading global conferences in the Metals & Mining domain.
  - **Designing & simulating PFDs*** of pre-combustion CO_2 capture for conceptualisation of a petcoke gasification facility.
- **Researcher, *SAMTEL*** *Summer Undergraduate Research Grant for Excellence* (*May-July'17*)
  ***Topic:* Adhesion Enhancement of Metal Nanoparticle Conductive Inks on Non-porous Substrates**
  - **Enhanced adhesion** between inert polymer surfaces and conducting inks comprising silver nanoparticles.
  - Spin-coated polymers - PEG, PVP and PAA - in water and ethanol as the intermediate layer.
  - Optimized between high adhesion and low wettability to facilitate deposition of interconnects with finer line width.
  - Used **Goniometer, FTIR and Scotch tape** to characterize the wettability, chemical composition and adhesion of ink.
- **Design of Solar based Water Treatment and Refrigeration Plant** (*May- July'16*)
  ***Mentor: Dr. Anil K. Rajvanshi**, Director, Nimbkar Agricultural Research Institute(NGO), Phaltan*
  - Designed a water treatment plant based on solar sterlization to support a population of 3000 member village.
  - Designed a **Solar based Vapor Absorption Refrigerator** and calculated the efficiencies & load for the proposed plant.

Academic Projects

- **Analysis of multi-component diffusion in multilayered assemblies via FDM** (*Feb'18-Apr'18*)
  ***Mentor: Prof. Kaustubh Kulkarni**, MSE, IIT Kanpur*
  - Computed the **spatial and temporal diffusion profiles** of single-phase multilayered assemblies having **variable diffusivities (composition dependent) using Finite Difference Method.**
- **Design of a Surface Steam Condenser based on Cost Optimization using Genetic Algorithm** (*Feb'18-Apr'18*)
  ***Mentor: Prof. Pankaj Wahi**, ME, IIT Kanpur*
  - Determined the optimum values of design variables for an Industrial scale Surface Steam Condenser by invoking GA.
- **Tribological behavior of Plasma Sprayed Tribaloy(T-400) Thermal Barrier Coatings** (*Aug'17-Dec'17*)
  ***Mentor: Prof. Kantesh Balani**, MSE, IIT Kanpur*
  - Performed characterization of coating sections (with the aid of **XRD, SEM & Vickers diamond indenter**) and **Tribological tests to quantify the wear damage** and analyze the wear behaviour and mechanisms involved.
- **Microstructure Modeling in Object Oriented Finite Element Method (OOF2)** (*Sept- Nov'16*)
  ***Mentor: Prof. Sudhanshu Shekhar, Prof. Nilesh Gurao**, Department of MSE*
  Performed **2D simulations to assess elastic deformation response** in microstructures of a Composite Material (reinforced with microfilaments) in the elastic regime, a Tungsten heavy alloy and a notched homogeneous single crystal.

Technical Skills

- **Programming Languages:** MATLAB, Octave, Python, CSS, HTML, LaTeX
- **Libraries and Frameworks:** Numpy, TensorFlow, scikit-learn, Keras
- **Softwares:** Autocad, SolidWorks, OOF2, Aspen HYSYS

Positions of Responsibility

- **DUGC Nominee, Department of MSE, IITK** (*Sept'17-Apr'18*)
  - Student Representative to the dept. committee overlooking matters related to the curriculum and academic opportunities.
  - Monitored & supervised the progress of academically weak students and handled any MSE UG program related problems.
- **Student Coordinator, Materials Science and Engineering Society** (*Sept'16-Aug'17*)
  - Initiated and organised a visit to laboratories and industries in Hyderabad. Assisted in organizing departmental activities.
- **Student Guide, Counselling Service Team** (*Aug'15- Apr'16*)
  - Mentored 6 freshmen and ensured their smooth induction to the campus and supervised registration of students.

Volunteer Experience

- **Community Volunteer, The Duke of Edinburgh's International Award Foundation** (*Apr'10- Apr'11*)
  - **Worked on developing better sanitation facility** for Jaidwar, a village in the Garhwal region of Uttarakhand. We constructed a set of three toilets (with septic tanks) for the village community.
  - Awarded the **Bronze standard** of the prestigious Duke of Edinburgh's **(International Award for Young People)** Foundation
- **Student Volunteer, National Institute For The Visually Handicapped** (*July'11-Sep'12*)
  - **Played indoor games and interacted with blind students** of NIVH, Dehra Dun every week for two hours.
  - Held discussions, quizzes and performed music for our combined recreation.

Publications and Conference Papers

- **Mittal, R.**, Senguttuvan, A., Chatterjee, S., Mukherjee, A., (2019) Development of a predictive model for minimizing ladle desulfurization cycle time and associated costs, *AISTech Conference Proceedings*, DOI 10.1000.377.223
- Chatterjee S., Senguttuvan, A., Biswal, A., Adak, A., Mandal. T, **Mittal, R.**, Ishwar. P., Sinha, K.K., Mukherjee, A.(2019), Ladle circuit optimization through simulations for reduced refractory wear, energy consumption and carbon emissions, *METEC-ESTAD Proceedings*.
- Ma, A., **Mittal, R.**, Chatterjee, S., Chattopadhyay, K., (2019) Development of a Predictive Tundish Open Eye Model Using Artificial Neural Network (ANN), *AISTech Conference Proceedings*, DOI 10.1000.377.227
- **Mittal, R.**, Mukherjee, A., Adabala S., Ragunath, N., Sinha S., Bose S., Chatterjee S., (2020) Development of a Real-Time Thermal State Index of Blast Furnace using Advanced Statistical Learning Techniques, accepted at *AISTech Conference '20*.

Extra-Curricular Activities

- Represented IITK in 4 **basketball** tournaments. Awarded **best incoming sportsman** of 2014.
- Regular performer at the IITK Music Club (keyboard exp-6yrs). **Won the IITK's western & eastern band** competition.
- Represented college in **national street theater** competitions. Performed plays to discuss & raise awareness on social issues.
- Avid trekker (Highest altitude - 16500 ft, Roopkund) and endurance runner. Won the IITK Mini Marathon 2015(10km)