naveen kushwaha

Modeling and Simulation engineer

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|  | Contact +91 9806123035  [nvnkush@gmail.com](mailto:nvnkush@gmail.com)  [nkushwaha@gmail.com](mailto:nkushwaha@gmail.com)  webpage: nvnkush.github.io |  | Profile Results-driven Chemical Engineer with over 7 years of experience in fluid dynamics, heat transfer, and particle flow dynamics. Demonstrated expertise in process optimization, computational fluid dynamics (CFD), and process safety management. Proven ability to lead cross-functional teams, improve manufacturing processes, and enhance product quality. Committed to driving innovation and sustainability within the chemical manufacturing sector. |
|  | key skills  * Computational Fluid Dynamics * Ansys Fluent (CFD), Ansys Rocky (DEM), OpenFOAM * MATLAB, Python, Machine Learning * High-performance computing environment experience * Chemical Process Design * Process Simulation and Modeling * Process Safety Management * Project Management * Technical Report Writing * Environmental Regulations and Sustainability * Team Collaboration and Leadership * Problem Solving and Critical Thinking |  | ExperienceSenior Process Engineer • feb 2024 - PresentDr. Reddy’s Laboratory, Hyderabad, INDIA  * Developed and optimized CFD models for various pharmaceutical manufacturing processes including mixing, crystallization, drying, and tablet coating. * Led process improvement initiatives, focusing on scaling up manufacturing processes and ensuring process efficiency. * Utilized Discrete Element Method (DEM) for developing particle dynamics models, improving equipment performance such as blenders and tablet coaters. * Conducted extensive case studies to validate CFD models and simulations at both laboratory and plant scales. |
| EDUCATION**PhD (7.14/10)**, *Chemical Engineering*, Indian Institute of Technology, Roorkee, India*,* (Dec. 2017-Jan. 2023)Modelling of Multiphase Fluid Flow and Heat Transfer Enhancement using Curved Surface. (PhD thesis).**M. Tech**. **(7.65/10),** Chemical Engineering, Indian Institute of Technology, Roorkee, India*,* (2015-2017)Heat transfer in curved channels, andEnhancement of Heat transfer in spiral coil using Nano-fluids.**B. E**. **(72.68%),** *Chemical Engineering*, Institute of Engineering, Jiwaji University, Gwalior, India (2010-2014)Process Upgrading of Heavy Crude Oil In-Situ Using Hydrogen. |

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| **Patents (2)**   * Kushwaha, N., Kumar, V., Twisted Elliptical Tube-In-Tube Helically Coiled Heat Exchangers. Indian Institute of Technology Roorkee, (Class: 23–03; Filed on: 10.09.2022; File number: 370616-001; Granted on: 25.01.2023). * Kushwaha, N., Silori, G., Kumar., V. 2021. A system and method for extracting shikimic acid from Chir pine needles. Application number 202111038776 dated 26.08.2021 (Published on 22/07/2022). |
| **Fellowships And Awards**   * Mitacs globalink research award 2021 * The ministry of human resource development (MHRD), India fellowship at Indian Institute of Technology, Roorkee in PhD (dec 2018 to dec 2022). * The ministry of human resource development (MHRD), India fellowship at Indian Institute of Technology, Roorkee during m. Tech. (July 2015 to Jun 2017). * Team leader in “Vigyan Manthan-Mission Excellence Programme” organized by M.P. council of science and technology, Bhopal, India during 27th January to 6th February 2008. * All India rank two (silver medal) in all India computer knowledge competition organized by national research institute of knowledge development, Chennai, India, 2005. |
| **Publications (7)**   * Kushwaha N, Vikash, Kumar V. “Impact of Mixed Convective and Radiative Heat Transfer in Spiral-Coiled Tubes”. ASME. J. Heat Transfer. 2019; <https://doi.org/10.1115/1.4043946>. * Silori G.K., Kushwaha N., Kumar V. (2019) “Essential Oils from Pines: Chemistry and Applications”. In: Malik S. (eds) Essential Oil Research. Springer, Cham. <https://doi.org/10.1007/978-3-030-16546-8_10> * Kushwaha N., Kumawat T, Nigam K, Kumar V. "Heat Transfer and Fluid Flow Characteristics for Newtonian and Non-Newtonian Fluids in a Tube-in-Tube Helical Coil Heat Exchanger" Ind. Eng. Chem. Res. 2020, 59, 9, 3972–3984; <https://doi.org/10.1021/acs.iecr.9b07044> (Invited manuscript for the special issue of “Characterization and Applications of Fluidic Devices without Moving Parts”). * Kushwaha N., Kumar V. “Numerical Study of Saturated Boiling Heat Transfer over the Flat and Curved Surfaces”. Heat Transfer. <https://doi.org/10.1002/htj.22640>. * Kushwaha N., Sasmito, A.P., Kumar V. “Vapour Bubble Dynamics and Heat Transfer Characteristics During the Boiling over the Spherical Surface” Heat Transfer <https://doi.org/10.1002/htj.22727> * Kushwaha N, Jain N., Kumar V, Nigam K.D.P., “Numerical Study of Liquid-Liquid Two-Phase Flow through Coiled Flow Inverters: Effect of Volume Fraction, Dean Number and Orientation” Chem. Eng. Sci. 2023, 268, 118409 <https://doi.org/10.1016/j.ces.2022.118409> * Kushwaha N, Kumar V, “Impact of Coil Curvature, Pitch, and Orientation on Vapor Hydrodynamics over Helically Coiled Tubes during Saturated Pool Boiling near Critical Pressure” Industrial & Engineering Chemistry Research, 62, 43, 18063-18078 <https://doi.org/10.1021/acs.iecr.3c02629> |
| **Conferences (6)**   * **Kushwaha N,** Kumar V, “Numerical Study of Saturated Pool Boiling Over Horizontal Tube”, 9th International and 49th National Conference on Fluid Mechanics and Fluid Power (FMFP 2022) * **Kushwaha N,** Kumar V, “Saturated Pool Boiling of Hydrogen over the Cylindrical Rod”, International conference on Chemical Engineering: Enabling Transition Towards Sustainable Future (Chemtsf 2022) * **Kushwaha N**, Jain N, Kumar V, Nigam KDP “Numerical Study of Liquid-Liquid Two-Phase Flow through Coiled Flow Inverters: Effect of Volume Fraction, Dean Number and Orientation” 15th International Conference on Gas-Liquid & Gas-Liquid-Solid Reactor Engineering (GLS 2022, AIChE) * **Kushwaha N.,** Kumar V. “Numerical Simulation of Film Boiling over Sphere using Suppressed Interface Tracking Method: A Two-Phase Approach” 16th international conference on heat transfer, fluid mechanics and thermodynamics (HEFAT-2022) * **Kushwaha N.,** Kumar V. “Numerical Simulation of Film Boiling over Sphere using Suppressed Interface Tracking Method: A Two-Phase Approach” 15th international conference on heat transfer, fluid mechanics and thermodynamics (HEFAT-2021) * **Kushwaha N.,** Kumar V. “Thermal performance enhancement in the spiral coiled tube heat exchanger using nano-fluids” Complex Fluids Symposium 2020 (COMPFLU-2020) |
| **Grants**   |  |  | | --- | --- | | * Co-PREPARE Academic Grant (CAG) for webinar on “Scientific & Academic Writing” | | | * Marco fund for SWEP Workshop 2021 | * Jagdish Narain Travel Grant. | | * Shri S.P. Elhence Memo. Travel Grant. | * Rai Bhadur Narain Travel Grant. | |
| **Project (1)**  Design Innovation centre (DIC) IIT Roorkee P2P project entitled “Investigation of a Himalayan pine species as a potential drug in the treatment of Swine flu (H1N1)”. Project Id-DIC-P2P-2018-19-05. |
| **Equipment Handling**  • Rheometer (Anton Par MCR702) • HPLC (waters) |
| **Services**  • DAPC member at Department of Chemical Engineering, IIT Roorkee (2018-2019)  • As reviewer in “Energy Conversion and Management” journal |
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**Equipment Handling**

• Rheometer (Anton Par MCR702) • HPLC (waters)

**Services**

• DAPC member at Department of Chemical Engineering, IIT Roorkee (2018-2019)

• As reviewer in “Energy Conversion and Management” journal