Kush Kotecha

Teesside | kush-kotecha.github.io | kush.kotecha.kk@gmail.com

Profile

I am a graduate Chemical Engineer who is seeking a challenging and fulfilling role, with the aim of producing high-quality, meaningful work which contributes to the success of my team and positively impacts the wider community. I have a particular interest in sustainability and renewable energies, but I believe I have proven to be an enthusiastic, effective, and committed individual through a variety of disciplines and I am open to all opportunities.

Education

Masters in Chemical Engineering | 2024 | University of Manchester - First class with honours (IChemE accredited)

- Modules studied in 4th year: Nuclear Fuel Cycle, Numerical Methods & Simulation, Sustainable Energy Systems, Utility System Design
- Modules studied in 3rd year: Batch Processing, Catalytic Reaction Engineering, Multi-component Engineering Separation, Process Control, Process Design, Process Synthesis, Sustainability
- Modules studied in 2nd year: Chemical Reactor Design, Distillation and Absorption, Engineering Maths 2 and 3, Materials Science and Mechanical Design, Momentum Heat and Mass Transfer, Process Integration, Process Optimisation, Process Safety, Solids Processing
- Modules studied in 1st year: Chemical Thermodynamics, Computational Methods, Engineering Biotechnology, Engineering Chemistry, Engineering Maths, Fluid Flow, Fundamentals of Thermodynamics, Process Engineering Fundamentals, Process Heat Transfer

A levels | 2020 | Queen Elizabeth Sixth Form College, Darlington

- Maths, Physics, Chemistry, Computing - A*, A, A, A

GCSEs | 2018 | Egglescliffe School, Stockton-On-Tees

- 11 GCSEs including Maths and English, three 9's, five 8's, three 7's

Skills & Abilities

- An analytical thinker with proven problem-solving skills; able to think on my feet and devise a range of possible solutions
- I am a quick learner and can implement new techniques into my work confidently
- A strong team player that is willing to take on different duties/roles in order for the team to be successful
- A confident communicator with solid presentation skills
- Fluent in English and Gujarati, and I have a basic level of conversational French
- Experienced with laboratory environments and equipment e.g. small scale distillation columns, cooling towers and heat exchangers, and emulsification sonolators
- Competent computer user, accomplished in Microsoft and several technical software packages, including HTML and SQL experience
- Proficient programmer, completing many projects in Python, C#, SQL, HTML, and participated in HP Codewars 2017 and 2018

- Familiar with simulation software such as Matlab and Simulink, Aspen Plus, Sprint and CcalC 2 (University of Manchester)

Work Experiences and Responsibilities

- Dissertation - Wetting of an electrolyte droplet on a graphite surface using Molecular Dynamics - The primary objective of my initial report was to perform a broad literature review about the topic. With a solid understanding of each component within the system, I was able to offer my own suggestions with a view to delivering work beyond my scope that contributed to the team's overall objectives. As a result, my simulations showed improvement in multiple properties of the system (especially the property of interest) and discovered opportunities for further development. I was taught how to create the input files for simulation which I supplemented with research focusing on how the system was simulated using Molecular Dynamics, including implementation of thermostats and barostats to control the environment, and use of finite difference and Particle Mesh Ewald summation methods to optimise run-time and data storage while maintaining accuracy. While the simulations were running, I delegated some time to creating Python codes which automated certain set-up and analytical procedures. I shared these with my colleagues to maximise their benefit and allow the team to focus on more important tasks. This code was created with abstraction in mind so that they could be applied within a variety of circumstances and included code comments so that they are easy to understand and adapt in the future (in my absence). I then spent some time applying the results to wider context, discussing product feasibility and the future of this technology's development. I had completed all of my responsibilities ahead of the deadline meaning I had time to perform preliminary simulations on another idea I had presented during initial discussions with my supervisor. As the results were inconclusive and did not satisfy the criteria I had set for the investigation, I presented my current findings for the report and continued the investigation after the deadline. In addition to improving system performance, the resulting work served two other purposes: to enable the exploration of a novel variable in the system; and to improve accuracy of the model. The initial investigation had been a topic of interest for the research group, however the other two investigations had not yet been considered - thus I shared all files and results, complimented by specific instructions.

- For my 3rd year design project, my group was tasked with designing a para-xylene manufacturing plant which was economically favourable, sustainable, and safe. This was split into 3 distinct parts: the first part involved deciding the best synthesis route so there was a large focus on literature research, data analysis, and collective decision making. I encouraged the team to work together in-person to support clear communication. We started each day with a meeting so that everyone was informed of our collective progress, and we could identify individual tasks for the day. Prior to the team meeting, I would take 30 minutes each morning to reflect on the team's overall progress and deliberate on subsequent steps - this yielded direction and intention during our meetings. The second part was independent and more technical in nature; I developed the optimised process design for a packed bed reactor along with options to perform sensitivity analysis – the model is shared on Matlab File Exchange for others to use and learn from. The third part involved bringing our designs together to analyse the economics, safety aspects, and environmental impacts of the overall facility design and agree on an optimal arrangement. Unfavorably, we executed this task with only two thirds of our team, and another person requested to work from home to partake in Ramadan. Some of the ways I supported the team to adapt to this issue included: allocating tasks that played to each team member's strengths – I was able to do this confidently as I now had a better understanding of each team member's capabilities, and each individual had a larger workload so fair distribution was important; I also relayed information to our colleague working from home at the end of the day (consisting of progress updates and appropriate tasks to perform) since he was working at night.
- Since university, I have supported my parents' tutoring company by teaching students which allows us to deliver a more bespoke service and meet the needs of each child more closely. Typically, I work with the same students to build a rapport which allows me to develop lesson plans based on topics that require improvement and the types of activities that the student engages with. I believe that a core aspect of teaching is to promote independence. I aimed to do this by working through the solution with them: encouraging them to suggest an initial approach to the problem, asking questions to stimulate their thought processes, and providing familiar examples so the solution was more readily understandable.

Extra Curricular

- Volunteer work - Provided meals and a fun, safe space for children at a local primary school during holidays as part of the ‘Make a Lunch’ youth group. I was responsible for preparing the vegetarian option and cleaning up in the kitchen. I have also volunteered to help at a coding club to teach basic coding skills using Python, Scratch, and BBC micro:bit for both children and adults. At university, I would cook large batches of food and hand it out to homeless people in the city and leave them packages containing clothes that no longer fit me, fruit, drinks, and treats. It is absolutely imperative to make sure every penny is spent effectively and goes directly to those that need it: by buying cheap, healthy, long-lasting foods (rice/pasta - carbohydrates; tinned vegetables - vitamins; tinned beans/tuna - proteins/fats; and biscuits/cordial - treats), and basic toiletries (toothpaste; soap; and feminine products). I am eager to get involved with charity and education that utilises my skills because I have much more to offer than financial value, particularly to vulnerable groups such as disabled, children, elderly, and animals.

- I am a keen musician and led the percussion section of Tees Valley Youth Orchestra. I partook in busking to raise money for local charities and fund international performances. I was also part of a Chinese music group called Yangchin where I learnt to play instruments such as the yangqin, guzheng, panpipes, and cajon, and we would regularly perform for residents at care homes.

- I value physical development as much as mental growth. The body is a vessel for the mind; empowering it gives you more freedom to explore, and develops independence. I am currently serving as a combat engineer in the British Army Reserves (Corps of Royal Engineers). The army supports me to be the best version of myself, and the CDRILS values (Courage, Discipline, Respect, Integrity, Loyalty, Selfless commitment) harbours a positive community and environment. A core attitude of the military is doing the right thing on a difficult day - being able to perform under adverse conditions such as low sleep, food, and water; and high stress, physical exertion, and risks. Thus when circumstances are more favourable or even optimal, the best case is improved performance while the worst case is a consistent output. Furthermore, the responsibilities and risks (i.e. survivability of myself and my teammates) demands that our skills are developed to the highest standards. This also makes the British Army capable of helping victims of global conflicts, natural disasters, and humanitarian crises.

- I enjoy spending time with animals and have two guinea pigs named Gin & Bean.