Students' Diary
Computational Methods in Materials Science

Sivakumar S
1st Year MTech, Industrial Metallurgy, MSME
Dy. Manager (Metallurgy), Hindustan Copper Limited
KID: 20210417

We all know the importance of the computer and the way it has simplified many otherwise complex tasks! Computers were so rapidly evolving in the last century and at a much faster pace, particularly in the last three decades. Today, we have high-performance supercomputers working towards the quantum computing future! With all the robust processing capabilities of modern high-performance computing machines, we can solve such complex problems by building mathematical models and simulations and predicting the result without even physically doing it, which not only cuts cost and development time but helps us study a different set of conditions at a fraction of time. Even vaccine development is accelerated these days with this! The coursework, Introduction to Computational Methods in Materials Science during my last Semester under Dr Saswata Bhattacharya provided me with the necessary training, tools, and motivation to explore and realize the possibilities the computational field can offer to find solutions to complex problems in the industry.

I work in Hindustan Copper Limited, where we mine copper ore, produce copper concentrate, smelt, and refine them, produce anode copper, copper cathode, and continuously cast copper rods at our various production units.

Some of these processes are very complex in nature and optimization of any of that using these computational tools by mathematical modelling and simulation might help us improve our business. Modelling the ore beneficiation process would help us improve the efficiency of the copper ore recovery during the floatation process and would lead to a reduction in the copper loss in the tailings. Modelling the continuous casting process **(as shown in Fig. 1)** could be used to optimize the different stages using these tools and techniques which was also my project work during the coursework.
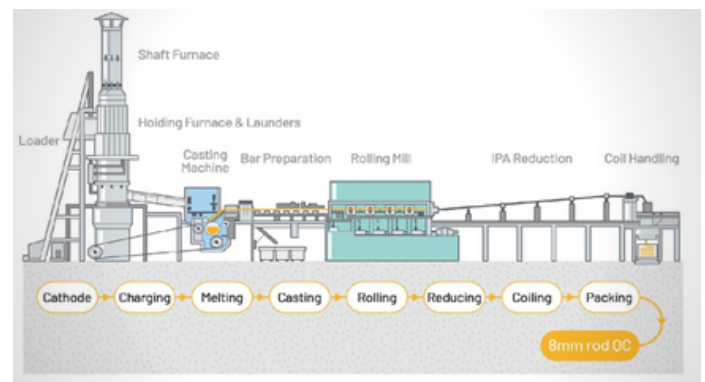

Fig. 25: A Typical Southwire Continuous Cast Copper Rod Production System

Why Computational Engineering???

Ishaan Jain
1st Year BTech
Computational Engineering
KID: 20210418

As this branch is new, I was a bit nervous about the opportunities that I could get in the future. But this branch involves all the other branches in its curriculum, which is itself a great thing. So, being in an IIT and studying about all the branches in just one course was kind of a WIN-WIN situation for me. As I read about the curriculum, it involved the usage of computational applications in various industrial processes that were also fascinating. And also, being one of the only ten students in the whole country, that too in one of the premier institutes in India was something that caught my attention. And after all, I'm very happy to be a part of this program at IITH.

My experience @IITH in the recent past
It was good, could have been better if we were at the campus. I interacted with a lot of my batchmates and seniors through social media. However, the clubs did a wonderful job till now. I played the mini-cryptex game and that was a wonderful experience. Also had a debate competition and some comedy shots by RangDeManch which was a great treat to be a part of. Our seniors never made us feel alone and isolated even when they were at the campus and we were at our home. Coming to the online classes, they are not as good as compared to if they were offline, but looking at the current situation, they're good. We had a lot of video calls unofficially and made a lot of friends in just a month which was a great thing. And later on, I was elected as the Class Representative of my branch which was a very big moment for me in just a month @IITH. But deep down, I'm waiting for us to be called at the campus and enjoy our college life which we're missing at our home.

BTech in Computational Engineering
Social Media Announcement