

## **Report on Blockchain summer school in Copenhagen**

Blockchain summer school in Copenhagen was one of the best events that I ever participated in that focuses on blockchain. The program contains the introduction of blockchain in industry and research, followed by the deep insight of how the current technology works and what is the expected output. Blockchain-based applications are dominating the industry and research world by providing new ideas into how to distribute a ledger without a third party. In this summer school, three different categories of the program were prepared. I only participated in the primary and medium levels of study and analysis. The program addresses a presentation from worldwide known researchers until industry implementation. I had a chance to meet experts that have been working on blockchain for the last ten years and more, which I believe learned more insight on what kind of work they have been doing and the future goals.

The program introduced industry-level problems, so each group was dedicated to solving the issues by using blockchain and related areas. The most exciting part is that every group is a mix of experts or students from different fields, engineers, businesses, scholars, and developers. Such kind of organization gave for most of the students like me a chance to see blockchain from different perspectives, for instance, from a lawyer's point of view. In this program, not only I understood the blockchain concept so well for my current works but also got a chance to see what other peers are doing at the moment and what they are willing to do in the future. The discussions include how blockchain is disrupting existing business models and will gain insights into paradigmatic changes occurring from economic, organizational, and computer science viewpoints. Working as a group helped us to be able to co-create new blockchain-based systems, taking into consideration both cryptographic and economic aspects. After making the discussion concrete, then we tried to set up a development environment and used proven platforms such as Ethereum, NEO, and others. Some of the problems we were trying to solve the problem by designing and developing smart contracts and made small codes in Dapps.

The last step of the program was presenting our new designed solution either in a developed manner or the abstract version. One of the projects I was involved in was introducing blockchain into the coffee market. As know, the farmers get a minimal benefit from there products because of intermediary agents that compromise the direct benefit plan. The methodology we proposed was to introduce blockchain as a middleware between the farmers, the import, and export companies so

that all the benefits should go to the primary producers. The architecture we proposed includes the limitation of access from the farmer side. Since Latin America countries and east Africa are high-quality coffee contributors, the design and implementation also focus on these areas. Based on the data we received from the company, most of these area has a lack of mobile devices and the ability to use the tools to get the benefit they deserved. To tackle this challenge, we introduce a submodule on our architecture that allows the farmers to send normal seems and receive the result in their everyday language with good descriptions. However, even with this in-depth analysis of the problem domain, still, the export and import companies like to see the farmland so that they can confirm it a quality product they are purchasing. The most challenging part was to include such a requirement in our proposed system since we were considering first phones with week limitations in access and utilization. To handle this hustle, we added one more integration in which cases each farmer has to upload the current status of the pharm using a phone by taking a picture. Mostly this idea gets more questions from the audience mainly because it makes the job of the farmer harder and the responsibility of the buyer simpler. As most researchers say' "There is always a tradeoff between performance and cost," we also tried to handle this limitation with a small cost but looks a bit expensive if we consider who will be responsible for maintaining the system and keeping it going. There were a lot of questions from the audience as well as from our colleagues.

The following are the key points that I gained from participating in the summer school:

1. Good communication with experts
2. Group works that involve discussion and system development
3. The chance to meet industries that are working on blockchain
4. Blockchain details were addressed by researchers, lawyers, entertainment companies, and scholars.
5. Meeting young researchers who have ambitions like mine

It was an excellent summer school with reasonable objectives and goals. I want to say Thank you for the opportunity I was given by COINS to cover all my expenses. I believe the knowledge I gained will help me to become a better researcher in the moment and future.