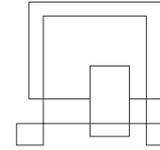


CERN – European Organization for Nuclear Research
Internship
August 2021 – January 2022

2nd Assignment
Company presentation

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Software Technology Engineering
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The organization

In terms of scientific research, CERN, the European Organization of Nuclear Research, is one of the world's largest and most reputable centers. Engineers and physicists at CERN study the fundamental nature of the universe. CERN is also the world's leading particle physics laboratory and the birthplace of the World Wide Web.

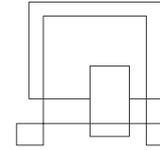
The world's largest and most powerful particle collider, the so-called Large Hadron Collider (LHC), is also located at CERN, where fundamental particles collide at close to the speed of light. The process gives physicists clues about how particles interact and provides insights into the fundamental laws of nature.

But what are they doing, really?

CERN is seeking answers to questions about the universe, like “*What is dark matter?*” [1], or “*What happened to the antimatter after the big bang?*” [2]. Before the Laboratory was founded, the structure of matter was unknown. Currently, we know that all visible matter in the universe is made of a small number of particles, whose behavior is governed by four different forces [3]. Due to the work of CERN, this understanding can now be reached.

In high-energy proton collisions at the Large Hadron Collider, physicists may be able to determine what this process might be based on the subtle differences in the behavior of matter and antimatter particles. Researchers could study this imbalance in order to gain a clearer understanding of why our universe is filled with matter.

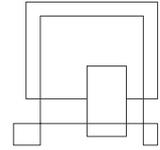
Moreover, one of the most highly demanding computing environments in the world is the one at CERN. The World Wide Web was initially developed at CERN to address



the need for information-sharing between scientists in universities and institutes throughout the world. Whether it is software development, data processing and storage, networks, support for the LHC and non-LHC experimental programme, automation and controls, or services for the accelerator complex and for the entire laboratory and its users, computing plays a very important role in CERN's infrastructure [4].

Have the scientists at CERN reached the end of their understanding of nature? Not at all. There is still a lot to discover about the Higgs boson, and there are many mysteries about the nature of matter in the universe. However, CERN makes sure to build even more advanced technology to observe and analyze how the universe works.

My role at CERN, as a technical student, is to create a new website that provides scientific videos and resources to the public. Within the IT Department where I work, the group Collaboration, Devices and Applications (CDA) provides information services such as video conferencing, webcast & recording, indico, the CERN Document Server (CDS), document conversion, printing, e-mail, IP telephony, the Invenio Digital Library Framework, Windows' environment tools, web services, authentication and authorisation services, e-publishing and software development tools on a range of devices, such as desktops, laptops, tablets and smartphones. In CDA there are multiple sub-sections, where mine, the Integrated Collaboration (IC), provides a wide range of AudioVisual & Collaborative Services for example webcast, indico, e-mail, authentication [5].



Sources of information

1. Dark matter [CERN]: <https://home.cern/science/physics/dark-matter>
2. The matter-antimatter asymmetry problem [CERN]:
<https://home.cern/science/physics/matter-antimatter-asymmetry-problem>
3. The Standard Model [CERN]:
<https://home.cern/science/physics/standard-model>
4. Computing [CERN]: <https://home.cern/science/computing>
5. Collaboration, Devices & Applications [CERN]: <https://information-technology.web.cern.ch/about/organisation/collaboration-devices-applications>