

Adapting Software, Hardware, and Programming Support in a Virtual Environment for the Boulder Solar Alliance Research Experience for Undergraduates Program

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November 23, 2022

Abstract

With the COVID-19 pandemic still active, the Boulder Solar Alliance Research Experience for Undergraduates (BSA REU) decided to keep the program remote for a second consecutive year. Our coordination team took lessons learned from the 2020 virtual BSA REU program and adapted the research experience to suit a virtual environment, especially with respect to increased technological support. The primary changes, as well as the reasons for implementing them, are outlined below. Due to the virtual nature of the program, all of the projects relied more heavily on coding. In response, the BSA REU team invested more time and resources in programming tutorials and weekly programming help sessions in Python, IDL, and MATLAB. The participants also faced unequal access to high-quality hardware resources in a remote environment. As a result, students received a technology stipend to help them upgrade their computer and internet resources. Additionally, with an increase in the focus on programming, a higher number of projects in 2021 involved machine learning and data science techniques compared to previous years. However, many of the students were unfamiliar with machine learning (ML) concepts. The coordination team provided an introductory ML lecture and tutorial during boot camp and hosted a weekly ML sub-group meeting to provide support and resources for students involved in ML projects. Finally, without being able to present results in person, it was important to provide an interactive online experience for the poster presentation session. To make the final poster presentation more engaging in a virtual environment, we used Gather Town, an online service where participants create avatars that can interact with the virtual environment. In this presentation, we will discuss how the adjustments to the BSA REU program in a virtual environment, including those listed above, and how we think REU programs can adapt to future remote and hybrid options. We will also discuss what elements of a remote program can be carried forward into an on-site program to enhance the on-site experience.

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Who I am...



Summer 2021 Coordination Team



Claire Raftery
(NSO)



Wendy Carande
(LASP)



Aimee Merkel
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**BSA REU
Coordinators**



Yunqian Zhu
(LASP)



Willow Reed
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Remote, again...



Challenge: More Coding-Intensive Projects



Boot Camp Week: more programming tutorials in IDL and Python

Weekly: programming help sessions in Python, IDL, and MATLAB

Anytime: Slack channels for programming support



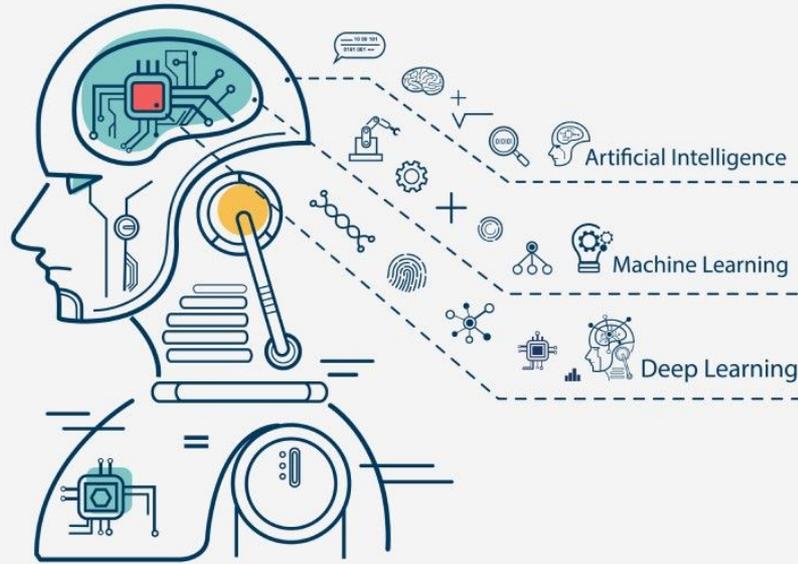
Challenge: Unequal Hardware Resources



Students received a technology stipend to help them upgrade their computer and internet resources.



Challenge: More Data Science Projects



Boot Camp Week: introductory ML lecture and tutorial

Weekly: ML sub-group meeting to provide support and resources for students involved in ML projects

Anytime: Slack channel for machine learning support



Challenge: Virtual Poster Session



To make the final poster presentation more engaging in a virtual environment, we used Gather Town, an online service where participants create avatars that can interact with the virtual environment.



Takeaways for the Future

- Increased coding and machine learning tutorials and support
 - Slack is a popular tool for asking and answering questions
- Try to address inequities in access to hardware where possible
 - Even in-person this could be relevant
- Gather Town is more interesting than Zoom breakout rooms
- Sub-topic groups are an effective mentoring strategy

