Group Discussion: Volunteer Computing – Fight against COVID-19!

Proteins are molecular machines that perform many functions we associate with life. They sense the environment (e.g. in taste and smell), perform work (e.g. muscle contraction and breaking down food), and play structural roles (e.g. your hair). Viruses also have proteins that they use to suppress our immune systems and reproduce themselves. Therefore, it is crucial to understand how these viral proteins work to design therapeutics to stop them. Proteins have lots of moving parts. Seeing the protein in action is important because it captures valuable information that is inaccessible by any other means. Using computer simulations to understand proteins' moving parts can help uncover alternative structures that may be the key to discovering a new therapeutic. However, these computer simulations require extensive computing power and billions of calculations simultaneously.

To help in the fight against COVID-19, Nvdia utilizes a project called Folding@Home. By using Folding@home, you can lend your central processing unit (CPU) and graphics processing unit (GPU) for COVID-19 related research and start putting your computing power toward finding a cure for COVID-19. Although a single user's computer is a small contribution, combination of many users' computing power makes a significant impact on advancing scientific knowledge. Such volunteer practices, also known as volunteer computing, have been around for years for various. Examples include searches for intelligent extraterrestrial life (SETI) project funded by NASA and various health related research (e.g., cancer treatment, Alzheimer's, Parkinson's diseases, and Huntington's diseases).

Read **Article 1** and **article 2**, and watch **Linus Tech Tips' video**. Then, install Folding@Home on your computer and answer the following questions. Please **see this slide deck** and the instructions below to install Folding@Home and j**oin the CU Denver team**:

1. Download and install Folding@Home from https://foldingathome.org/start-folding/
2. After you install it, you will be directed to the welcome page. Welcome page is a **web client** where you can set up your account and join the **CU Denver team**.
3. Select "Set up an Identity" and Click "Start Folding" – *See the screenshot on slide #8*.
    - Enter your name and surname for your identity. For example: ErsinDincelli.
4. To join **CU Denver Folding Team**, enter the details below. You can enter these details on the left hand side of the main screen by clicking "Change Identity" – *See the screenshot on slide #9*.
    - Team #: 256041
    - Pass: cc7efea5158b0d2acc7efea5158b0d2a
5. The main screen shows the details of folding.
    - To help in the fight against COVID-19, you need to select "Any disease" in the list "I support research fighting" – *See the screenshot on slide #10*.
    - You can adjust how much computer power you want to assign on the main screen.
    - Click "Learn", "News", and "Help" to learn more about Folding@Home
6. You can close the web client (browser) any time and still continue folding. Folding@Home application (FAHClient) is actually idling in the background on your computer right now. Right click on the Folding@Home application on your system tray and select "Advanced Control" to see more details about the folding process – *See the screenshot on slide #13*.

After you install and start running Folding@Home for a day or two, answer the following questions:

1) What do you think about such volunteer computing projects that are aimed to help scientists develop new therapeutics to a variety of diseases?

2) Have you participated a volunteer computing project before? If so, which one was it? Describe your experience.

3) Would you run a volunteer computing application, such as Folding@Home, to help scientific research, such as finding a cure for COVID-19?

4) What are some of the factors that would make you use it? Explain in detail why you would or would not use it.

5) If there was no COVID-19 pandemic, would you use Folding@Home for other diseases? Explain why you would or would not.

6) What features would you like to see in an information system like this?

7) Install and continue using Folding@Home when your computer is idle for a few days. Has your opinion about volunteer computing has changed? If so, what has changed?

8) Take a screenshot of the Folding@Home Client Advanced Control (see step #6 above) and attach it to your post. Note that your name and team number (256041) should be visible – *See the screenshot on slide #9*.

Part 1 (10 points): Your initial post should be in the length of 750 words. Note that you need to use the software before you answer the questions. Therefore, do not wait for the last day of the deadline to start the assignment. **Your post should be posted by May 1, Friday at 11:59 pm**.

Part 2 (10 points): Read your classmates' posts and post at least **three responses**. Your responses should incorporate the concepts from your own research, that is articles from reputable sources. **Responses are due by May 8, Friday at 11:59 pm**.

Note that you must create a thread in order to view other threads in this forum. Once posted, your response cannot be deleted or edited. Late submissions are not going to be accepted. Click on the **+ Expand All** button to view all of the entries made by the members or click each one, one at a time.