

EXAM 1: Artificial Reality: Computer Human Interaction- CS677

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Your NAME:

Do all FIVE questions. If you have any questions, please raise your hand and I will get to you. If you need more space to write the answer then use the back of the page.

Question 1 (a): (10 points) Explain the *Glow-Flow* experiment.

Question 1 (b): (10 points) Explain *Video-Touch* and its importance.

Question 2 (a): (10 points) (Logarithmic Motion Function)

Given $f(t) = d - d e^{-kt}$ where d is the distance to the object and k a proportionality constant for the change. Explain a simple and efficient implementation of this logarithmic motion.

Question 2 (b): (10 points) (Orienting a viewpoint to face a POI) Explain the algorithm so that the viewpoint is oriented to face a POI.

Question 3: (20 points) (Autocalibration) Why is the autocalibration necessary? Explain the iterative method of finding the position of the LEDs.

Question 4: (20 points) (CAVE Automatic VE) Describe the workings of the CAVE Automatic VE.

Question 5 (a): (10 points) (Fore-feedback) Discuss the overall configuration of the force-feedback experiment. Using the Figure 1 on the next page, explain the equations 1, 2 and 3.

Question 5 (b): (10 points) (Handling the Camera) Using the equations 1-5 and Figure 2 on the next page, explain how the equations are being solved, and what force feedback would be felt by the user. In other words, describe the experience.

Figure 1: Equations 1-3, and the mechanical configuration of the parallel manipulator.

Figure 2: Equation 4 and 5, and force and moment vectors at the palm.