However, if the generation of these incorrect answers can be done in an automated manner, it will be quite useful – as it will save time for the instructor, and different sets of incorrect answers can be shown to different candidates. However, it is very much necessary to ensure that the generated incorrect answers (called distractors) are in the context of the questions, and they are not semantically equivalent. Otherwise, they can be easily eliminated by the test taker. We are working on automatically generating such grammatically correct long distractors for reading comprehension tasks.

Automated generation of correct responses and appropriate follow-up questions are at the center of conversational systems. It requires correctly understanding the intent of the questions, and also keeping track of the entire conversation as the user can specify his/her complete requirement in multiple turns. We are developing algorithms that can keep track of such dialogue states and ask/answer appropriately to understand the complete requirement.

Thorough understanding of textual content can be helpful in many ways. Social media posts generated during disasters often carry ground-level information from the affected regions. Efficient retrieval of such posts generated during can give actionable insights regarding the effect at specific regions, the requirements of resources (food, water, medicines, blankets etc.) at different locations, the efforts of different NGOs and individuals. All this information can be quite helpful in the planning rescue and relief operations significantly, and mitigate the suffering of the people in the affected regions.

Natural Intelligence & AI – Spinal Cord and Movement Laboratory

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Most popular AI and ML algorithms from the perceptron to CNNs have been inspired by principles of computational neuroscience. Our lab works on building large multiscale simulations of the spinal cord, muscles and skeleton to achieve movement using biological mechanisms across scales. Using the in-silico movement platform NEUROiD built in our lab, we explore methods by which our brain learns to manipulate the spinal circuits in order to achieve the desired movement.

In the context of AI, we use this platform in order to understand the general algorithms that underlie movement circuits in nature. If one may think of the muscle and skeleton as a natural robot, the spinal cord is a robotic controller that constantly adjusts drive and works in a closed feedback loop with the natural robot. The brain can similarly be thought of as a reinforcement learning system that uses the natural robot along with the spinal controller to achieve a movement. The tautness in muscles informs the brain of the internal state of the robot. Our eyes and sense of touch provide the rewards to the brain, telling them whether a movement is desirable or not.

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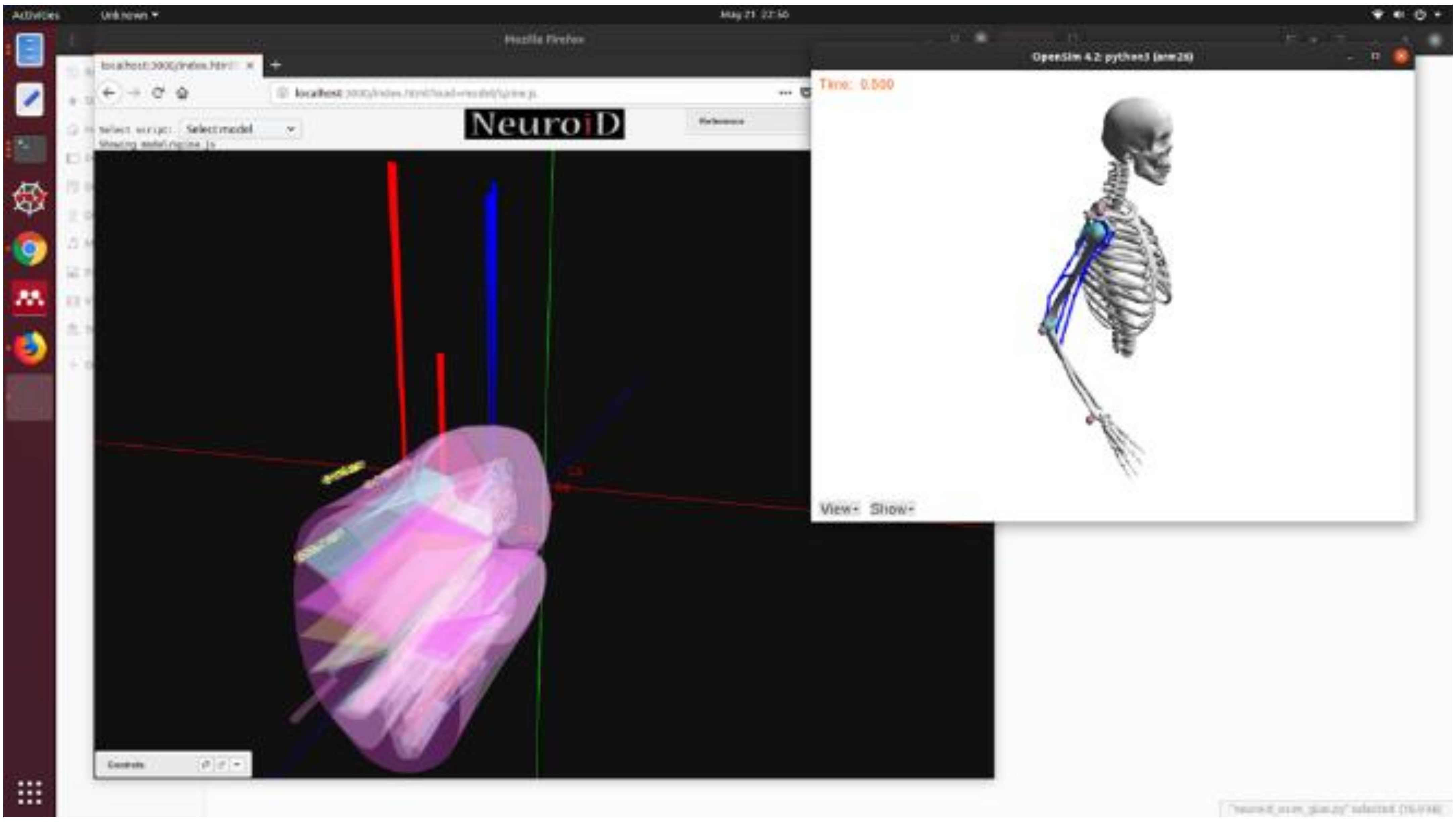

Figure 6: A screenshot from the NEUROiD in silico movement platform with the spinal cord controller(left) and the natural robot - a human hand (right)

Drone Based Sensing and AI Driven High-Throughput Phenotyping for Agriculture

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In recent years, automation, imaging solutions have paved the way for many high throughput phenotyping studies in agriculture. In the current scenario, the standard phenotyping methodologies (i.e., manual observations or laboratory assessments) are costlier, time-consuming, labor-intensive, destructive, and are frequently not standardized. Semi-automated systems have also been applied to investigate various components of plant growth and development, thus contributing to crop improvement programs. Researchers used ground-based platforms like handheld, fixed position static cameras, ground-based imagery sensors to capture the images of the crop fields. However, the field of view of the static cameras is minimal, and hence these techniques are not widely adopted in the real-time scenario.

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