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Contribution ID: 3169 Type: **Oral Competition (Undergraduate Student) / Compétition orale (Étudiant(e) du 1er cycle)**

(U*) An augmented-reality setup to improve accuracy in surgical chronic kidney mice model

Tuesday, 7 June 2022 14:00 (15 minutes)

The 5/6 nephrectomy is a prevalent model in the analysis of chronic kidney disease. It often takes the form of a surgical resection of 5/6 of the renal mass in two, distinct surgical procedures. The first step involves the resection of 2/3 renal mass from the left kidney. The second stage is a complete resection of the right kidney after one week. The initial 2/3 resection is critical to the success of the model overall and has a large impact on downstream data collection. With increased variability between procedures and operators comes an increase in phenotype variability, with a high discard rate of 36% and waste of animals. We developed a program, along with a fully supported hardware and firmware suite consisting of a high-resolution camera connected to a laptop or tablet. The software identifies the kidney in the image and provides cut points overlaid to the camera image in real-time to the surgeon who then traces along those lines to complete the procedure. Augmented reality and image processing are done using a deep learning approach. Through this research, we hope to significantly increase the precision and reproducibility of the surgery to increase the success rates and decrease the number of animals that meet the resection goal. Software and setup will be made publicly available and shared with research groups worldwide.

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