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### **“Words Fail Me”: The Loss of Language and the Language of Loss in Virginia Woolf’s Novels**

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*Washington University in St. Louis*

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# DEVELOPING A COMPUTER VISION ALGORITHM TO DETECT MOVEMENT IN THE ENVIRONMENT FOR THE ARGUS II RETINAL PROSTHESIS

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The Argus II is an FDA-approved retinal prosthetic device created by the Second Sight company. The prosthesis allows a subset of blind individuals to visualize information. This device has been proven to help individuals see information from the environment that is relevant to their daily needs. However, the current device has been limited to visualization of static, non-moving objects and has no permitted blind individuals to safely walk through an environment without running into objects. The goal of this project is to help visually impaired patients autonomously walk around by allowing them to visualize the motion of objects and people around them as they navigate through their environment. A computer vision algorithm was created in Python using optical flow from the OpenCV library to show the motion of the surrounding area as the user moves. The purpose of the algorithm is to differentiate between the motion of the user and the motion of objects and people around the user. The algorithm takes the motion data from optical flow and determines which vectors correspond to the user's motion and which vectors correspond to object motion, and it then transforms the vectors so that only the object motion is shown as the output. For more reliable results, a moving average filter is implemented into the algorithm so that edges and random jolts from the camera do not give false positives of object motion. This algorithm has met bench top level validation, but further testing needs to be performed before implementing in patients.