Title: Computer Vision Using the Microsoft Xbox 360 Kinect in Order to Play an Interactive Invisible Drum Set

The field of computer vision and machine learning has advanced rapidly over the last decade as a result of powerful compact computers able to handle the large processing required for such technology. The mass production of the Microsoft Xbox 360 Kinect has allowed for cheap 3D spatial vision through cameras and light sensors. This project uses this technology in order to create an interactive drum set that can be played by the user using computer vision user tracking. Detection and tracking of various joints in the body allow for the user to play a fully functional drum set without the costs or noise associated with physical drum sets. This project demonstrates the ease of basic computer vision programming in order to encourage more research into this important field. The project works by recording the 3D Cartesian coordinates of a user’s joints in order to compare it with preset Cartesian values that correspond with the various parts of the drum set. The Processing application used for this project is designed for visual arts hobbyists and is used in conjunction with SimpleOpenNI which is a Java based application wrapper to access the Microsoft Kinect’s user tracking features without a large learning curve. This allows for many nontechnical users unfamiliar with complex computer vision algorithms to be introduced to how computer vision works and focus on projects outside of the realm of robotics and engineering in general. These nontechnical users can contribute their own proof of concepts to further drive this research field.