

M.Sc. Thesis Defense  
Evaluating Finger  
Orientation for Position  
Awareness on Multi-Touch  
Tabletop Systems  
by  
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Abstract

Interactive tabletop systems are becoming popular platforms for group activities. However, the most common type of current tabletops do not provide capabilities to differentiate interactions among simultaneous users, i.e. to associate a touch point with its proper owner or position awareness (PA). These capabilities can significantly enhance the utility of tabletops. My thesis proposes and explores the use of an important biometric property of users as the basis for PA on multi-user tabletop systems: Finger Orientation (FO). My research has the following steps: First, I collected the different range of values of FO of users standing in different positions around a tabletop. I use this data to train a machine learning system that uses FO to determine where the users are standing, and based on that extrapolate the position of the users. I evaluated the system with three separate experiments, present the results, and discuss all findings. My results provide accuracies in the 95% range. I further explored some enhancements to my algorithms with an end-user corrective model. Overall, my results indicate that finger orientation is a highly accurate and useful natural biometric trait that can enhance multi-user recognition on tabletops.