



Submission Option #1

Your name: Duncan McSporran		
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Your e-mail address duncan@kognitivspark.com		
What type of research project?		
Analysis of Software or Hardware Issues	Click here →	<input checked="" type="checkbox"/>
Market Research	Click here →	<input type="checkbox"/>
Business Process Innovation Issues	Click here →	<input type="checkbox"/>
New Standards Development	Click here →	<input type="checkbox"/>
Topic of proposed research project		
<i>Please make this field (the title of your submission) as descriptive as possible</i>		
Facilitated User Interactions for Selecting and Manipulating Virtual Models in Augmented Reality		
Goal of research project (400 words)		
<i>When describing the topic you propose the AREA to study, focus on wider ambition, define the aim or desired result. What is the challenge that this research project would seek to address/resolve? Who's problem will this research project address? What you are looking to understand, create or find out more insight?</i>		
<p>The promise of mixed reality for many industrial applications is for virtual models to be interacted with and manipulated. This would, for example, allow a remote expert to demonstrate to an operative how to remove a coupling from an engine, by working with a virtual model of the real engine with which the operator is working. Technologies such as the Microsoft Hololens provide hand tracking, allowing both an operative and remote expert to work naturally. However, current hardware tracking is limited making simple tasks such as targeting and selecting objects in AR/MR slow and cumbersome, which ultimately leads to frustration with the technology and distraction from the main task. The basic interactions needed for such scenarios, including selecting objects (such as a bolt) and manipulating them (unscrewing a bolt) are difficult and not easily achieved with out-of-the-box interactions. In this research project, we will identify, apply and adapt interactions that will allow for effective realtime interaction with and manipulations of 3D virtual models. These will incorporate off-the-shelf tracking hardware for natural interactions, such as the Leap Motion.</p> <p>We will perform a usability study to evaluate the effectiveness of the identified alternatives.</p>		
What are the specific objectives for the research?		
<i>Please use SMART objectives (Specific, Measureable, Achievable, Realistic and Time-based) – clearly define the objectives (these can be, for example, the preparation of specific deliverables) so they can be measured against the project outcomes.</i>		

1. Create a test-bed that combines a hand tracking system (e.g., Leap Motion) with an AR headset (e.g., Microsoft HoloLens).
2. Identify and produce alternatives for interacting with virtual models in 6-DOF.
3. Perform a usability study to collect user feedback and performance data when using alternative interactions.
4. Write a report summarizing the research findings and present them to an AREA Members Research Projects Webinar.

Who do you think has expertise to conduct this research?

You can suggest your own organization or a third party.

* Dr. Scott Bateman, Director of the Human-Computer Interaction Research Lab, University of New Brunswick

Additional information: watch <https://youtu.be/gFKiibu2w00>