

Paper 1

Title: REVEL: Tactile Feedback Technology for Augmented Reality

Author(s): Olivier Bau, Ivan Poupyrev

Institutional Affiliation of Authors: INRIA Saclay (Palaiseau, France), Sony Computer Science Laboratories, Inc. (Tokyo, Japan)

Journal name:

Publisher Name: [ACM](#)

Year of Publication: July 2012. Volume 31, Issue 4
Issue and Volume (if mentioned)

Abstract:

REVEL is an augmented reality (AR) tactile technology that allows for change to the tactile feeling of real objects by augmenting them with virtual tactile textures using a device worn by the user. Unlike previous attempts to enhance AR environments with haptics, we neither physically actuate objects or use any force- or tactile-feedback devices, nor require users to wear tactile gloves or other apparatus on their hands. Instead, we employ the principle of reverse electrovibration where we inject a weak electrical signal anywhere on the user body creating an oscillating electrical field around the user's fingers. When sliding his or her fingers on a surface of the object, the user perceives highly distinctive tactile textures augmenting the physical object. By tracking the objects and location of the touch, we associate dynamic tactile sensations to the interaction context. REVEL is built upon our previous work on designing electrovibration-based tactile feedback for touch surfaces [Bau, et al. 2010]. In this paper we expand tactile interfaces based on electrovibration beyond touch surfaces and bring them into the real world. We demonstrate a broad range of application scenarios where our technology can be used to enhance AR interaction with dynamic and unobtrusive tactile feedback.

State the research problem of the paper in your own words:

Making the AR experience much better by including tactile feedback on a touch of surface without any wearable gadgets.

Paper 2

Title: The Mixed Reality Book: A New Multimedia Reading Experience
Author(s): Raphaël Grasset, Andreas Dünser, Hartmut Seichter, Mark Nathan Billinghamurst
Institutional Affiliation of Authors: University of Canterbury (Christchurch, New Zealand)
Journal name:
Publisher Name: ACM
Year of Publication: April 2007 Issue and Volume (if mentioned)
Abstract: We are introducing a new type of digitally enhanced book which symbiotically merges different types of media in a seamless approach. By keeping the traditional book (and its affordance) and enhancing it visually and aurally, we provide a highly efficient combination of the physical and digital world. Our solution utilizes recent developments in computer vision tracking, advanced GPU technology and spatial sound rendering. The systems' collaboration capabilities also allow other users to be part of the story.
State the research problem of the paper in your own words: Making the softcopy book reading experience like actual hardcopy book reading.

Paper 3

Title: Spatial Sound Localization in an Augmented Reality Environment
Author(s): Jaka Sodnik, Sašo Tomažič, Raphaël Grasset, Andreas Dünser, Mark Nathan Billinghamurst
Institutional Affiliation of Authors: University of Ljubljana (Ljubljana, Slovenia) x 2, University of Canterbury (Christchurch, New Zealand) x 3
Journal name:
Publisher Name: ACM
Year of Publication: November 2006 Issue and Volume (if mentioned)
Abstract: Augmented Reality (AR), the overlay of virtual images onto the real world, is an increasingly popular technique for developing new human-computer interfaces. As human navigation and orientation in different environments depend on both visual and auditory information, sound plays a very important role in AR applications. In this paper we explore users' capability to localize a spatial sound (registered with a virtual object) in an AR environment, under different spatial configurations of the virtual scene. The results not only confirm several previous findings on sound localization, but also point out some important new visual-audio cues which should be taken into consideration for effective localization and orientation in the AR environment. Finally, this paper provides tentative guidelines for adding spatial sound to AR environments.
State the research problem of the paper in your own words: Making the AR experience much better by including spatial sound.

Paper 4

Title: FingARtips – Gesture Based Direct Manipulation in Augmented Reality
Author(s): Volkert Buchmann, Mark Nathan Billinghamurst, Stephen Violich, Andy J G Cockburn
Institutional Affiliation of Authors: University of Canterbury (Christchurch, New Zealand)
Journal name:
Publisher Name: ACM
Year of Publication: June 2004 Issue and Volume (if mentioned)
Abstract: This paper presents a technique for natural, fingertip-based interaction with virtual objects in Augmented Reality (AR) environments. We use image processing software and finger- and hand-based fiducial markers to track gestures from the user, stencil buffering to enable the user to see their fingers at all times, and fingertip-based haptic feedback devices to enable the user to feel virtual objects. Unlike previous AR interfaces, this approach allows users to interact with virtual content using natural hand gestures. The paper describes how these techniques were applied in an urban planning interface, and also presents preliminary informal usability results.
State the research problem of the paper in your own words: Making the AR experience much better by including haptic feedback on a touch of surface.

Paper 5

Title: Map Torchlight: A Mobile Augmented Reality Camera Projector Unit
Author(s): Johannes Schöning, Markus Löchtefeld, Antonio Krüger, Michael Rohs, Sven G Kratz
Institutional Affiliation of Authors: Institute for Geoinformatics (Münster, Germany) x 3, Deutsche Telekom Laboratories (Berlin, Germany) x 2
Journal name:
Publisher Name: ACM
Year of Publication: April 2009 Issue and Volume (if mentioned)
Abstract: The advantages of paper-based maps have been utilized in the field of mobile Augmented Reality (AR) in the last few years. Traditional paper-based maps provide high-resolution, large-scale information with zero power consumption. There are numerous implementations of magic lens interfaces that combine high-resolution paper maps with dynamic handheld displays. From an HCI perspective, the main challenge of magic lens interfaces is that users have to switch their attention between the magic lens and the information in the background. In this paper, we attempt to overcome this problem by using a lightweight mobile camera projector unit to augment the paper map directly with additional information. The "Map Torchlight" is tracked over a paper map and can precisely highlight points of interest, streets, and areas to give directions or other guidance for interacting with the map.
State the research problem of the paper in your own words: Replacing paper-based maps with an application based on AR.

Paper 6

Title: Examining Augmented Reality to Improve Navigation Skills in Postsecondary Students With Intellectual Disability

Author(s): Cate C. Smith, David F. Cihak, Byungkeon Kim, Rachel Wright, Don D. McMahon

Institutional Affiliation of Authors: Appalachian State University (Boone, NC, USA), University of Tennessee (Knoxville, TN, USA) x 3, Washington State University (Pullman, WA, USA)

Journal name:

Publisher Name: [Sage](#)

Year of Publication: March 1, 2017. Volume 32, Issue 1
Issue and Volume (if mentioned)

Abstract:

The purpose of this study was to examine the effects of using mobile technology to improve navigation skills in three students with intellectual disability (ID) in a postsecondary education program. Navigation skills included using an augmented reality iPhone app to make correct “waypoint” decisions when traveling by foot on a university campus to target destinations. The results indicate that all students improved their navigation skills. Findings are discussed in the context of teaching the use of mobile technology to improve wayfinding skills in students with ID.

State the research problem of the paper in your own words:

A navigation mobile application for disable people.

Paper 7

Title: Using Augmented Reality to Plan Virtual Construction Worksite
Author(s): Xiangyu Wang
Institutional Affiliation of Authors: Duke University
Journal name:
Publisher Name: Sage
Year of Publication: December 1, 2007. Volume 4, Issue 4 Issue and Volume (if mentioned)
Abstract: Current construction worksite layout planning heavily relies on 2D paper media where the worksite planners sketch the future layout adjacent to their real environment. This traditional approach turns out to be ineffective and prone to error because only experienced and well-trained planners are able to generate effective layout design with paper sketches. Augmented Reality (AR), as a new user interface technology, introduces a completely new perspective for construction worksite planning. This paper discusses the related ART work and issues in construction and describes the concept and prototype of an AR-based construction planning tool, AR Planner with virtual elements sets and tangible interface. The focus of the paper is to identify and integrate worksite planning rules into the AR planner with the purpose of intelligently preventing potential planning errors and process inefficiency, thus maximizing the overall productivity. Future work includes refining and verifying AR Planners in realistic projects.
State the research problem of the paper in your own words: Replacing the paper based work done for construction sites with augmented reality.

Paper 8

Title: Enhancing the Tourism Experience through Mobile Augmented Reality: Challenges and Prospects

Author(s): Chris D. Kounavis, Efpraxia D. Zamani, Anna E. Kasimati

Institutional Affiliation of Authors: Department of Management Science and Technology, Athens University of Economics and Business (Greece) x 2, Department of Digital Systems, University of Piraeus (Athens)

Journal name:

Publisher Name: [Sage](#)

Year of Publication: July 23, 2012. Volume 4
Issue and Volume (if mentioned)

Abstract:

This paper discusses the use of Augmented Reality (AR) applications for the needs of tourism. It describes the technology's evolution from pilot applications into commercial mobile applications. We address the technical aspects of mobile AR application development, emphasizing the technologies that render the delivery of augmented reality content possible and experientially superior. We examine the state of the art, providing an analysis concerning the development and the objectives of each application. Acknowledging the various technological limitations hindering AR's substantial end-user adoption, the paper proposes a model for developing AR mobile applications for the field of tourism, aiming to release AR's full potential within the field.

State the research problem of the paper in your own words:

Making the tourist's experience much better using an mobile application based on augmented reality.

Paper 9

Title: Augmented Reality in Medical Education and Training
Author(s): Jennifer Herron
Institutional Affiliation of Authors: Indiana University School of Medicine (Indianapolis, IN, USA)
Journal name:
Publisher Name: Taylor & Francis
Year of Publication: 24 May 2016 Issue and Volume (if mentioned)
Abstract: Augmented reality, while not necessarily a new technology, is becoming more well-known and gaining some momentum in medical education through Google Glass and Microsoft's HoloLens. Not only can augmented reality aid in student education, but it also can impact patient care through its ability to enhance medical training. Medical libraries can partake in this new endeavor by being aware of applications in augmented reality that can benefit students and educators.
State the research problem of the paper in your own words: Application of augmented reality in medical training.

Paper 10

Title: Vision-Based Hand Interaction in Augmented Reality Environment
Author(s): Y. Shen, S. K. Ong, A. Y. C. Nee
Institutional Affiliation of Authors: National University of Singapore (Singapore)
Journal name:
Publisher Name: Taylor & Francis
Year of Publication: 09 May 2011 Issue and Volume (if mentioned)
Abstract: A new vision-based framework and system for human–computer interaction in an Augmented Reality environment is presented in this article. The system allows the users to interact with computer-generated virtual objects using their hands directly. With an efficient color segmentation algorithm, the system is adaptable to different light conditions and backgrounds. It is also suitable for real-time applications. The dominant features on the palm are detected and tracked to estimate the camera pose. After the camera pose relative to the user's hand has been reconstructed, 3D virtual objects can be augmented naturally onto the palm for the user to inspect and manipulate. With off-the-shelf web camera and computer, natural bare-hand based interactions with 2D and 3D virtual objects can be achieved with low cost.
State the research problem of the paper in your own words: Portraying the computer generated object (2D/3D) onto a human's hand.