

Tinmith Backpack 2006 and Outdoor Augmented Reality Applications

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ABSTRACT

This demonstration presents our latest mobile outdoor augmented reality system and applications that currently run on it. Our previous backpack designs were simple collections of commercial components arranged onto a frame, optimised for flexibility in changes rather than size. Our new design is made up of many custom components as well as highly modified commercial components to reduce its size, and is wearable using only a belt if desired. The new design uses technologies such as wireless to reduce size and weight, and user interfaces to configure the system when no input devices are available. We will demonstrate applications such as our Tinmith mobile outdoor augmented reality system and our ARQuake game.

1 INTRODUCTION

In this demonstration, we will present our latest mobile outdoor augmented reality (AR) system with head mounted display, the Tinmith Backpack 2006 (see Figure 1). This system has been designed from the ground up to be as small and light as possible, while including the highest performance components currently available. Our previous systems were designed for flexibility and experimentation, with various standard components arranged onto a frame with large cables and connectors. These older systems were similar in design to what other research groups have produced. Designs that allow flexible changes are prone to being quite large and bulky however, with much space lost to the cables, connectors, and cases. Recently, we have found that the components we have been using for our research have been static enough that we have been able to commit to a design that can be miniaturised. While there are a number of wearable computer systems that can be purchased which are quite small, they are not designed for high-end augmented reality applications that demand intensive graphics processing and integrated tracking.

This demonstration will also demonstrate various applications that we have developed that run on our system. The Tinmith-Metro 3D modelling (see Figure 2) allows a user wearing pinch gloves to edit existing geometry and create new geometry outdoors. We have implemented a number of novel techniques to support efficient modelling of large structures that are out of arm's reach of the user. New wireless pinch gloves will be shown, featuring hidden sewn in wiring and Bluetooth to improve robustness and portability. The ARQuake system (see Figure 3) allows users to play games against computer-generated monsters outdoors.

2 MORE INFORMATION

More information such as videos, pictures, and papers about the project and the lab is available from <http://www.tinmith.net> and <http://wearables.unisa.edu.au>



Figure 1 – The current Tinmith Backpack 2006 design presented in this demonstration. All components are fully contained within either the belt-mounted main case or the helmet, making the system small and robust.



Figure 2 – Tinmith-Metro outdoor AR modelling application

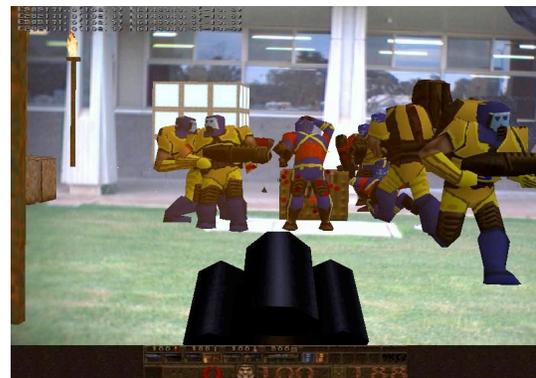


Figure 3 – ARQuake outdoor gaming system