

Example Projects 2006



Joel Seligstein, University of Tennessee USA (ODCSSS@UCD)

Collaborative Visualisation
Gesture-based Fisheye Imaging
 Joel Seligstein
 ODCSSS 2006
 Supervisor: Dr. Aaron Quigley

Fisheye Imaging	Gesture Interaction	Applications
<ul style="list-style-type: none"> Using fisheyes over traditional zoom techniques balances focus and context! Unlike traditional fisheyes, image data is pulled from a larger baseline image to display more detail of the zoom region rather than interpolating points of the smaller image, which can result in blurring 	<ul style="list-style-type: none"> DiamondTouch allows multi-user multi-touch interaction Touching creates a fisheye lens and grows it vertically until release Touching moves an existing lens Two fingers in an outward motion stretches a lens <ul style="list-style-type: none"> Tapping a lens deletes the fisheye Moving a palm pans the entire image 	<ul style="list-style-type: none"> Tissue Microarray researchers can zoom a particular cell without losing context in matrix of cells <ul style="list-style-type: none"> Map searching

Devices such as the DiamondTouch provide the first step to the provision of more natural, touch-driven interfaces for groups working together. Personal computing using devices such as desktops, laptops, tablets, phones and PDAs are useful for certain aspects of activities but typically they do not have the scale or resolution required for the novel display of large graphical models in a multiuser environment. In this project Joel developed a DiamondTouch based gesture driven application for the collaborative visual exploration of Tissue Micro Array data collected in the Conway instate in UCD. His fisheye gestures supported the interactive warping of the image for focus in context views of the matrix of cell biopsies.

Jing Chen, University College Dublin, Ireland (ODCSSS@DCU)

3D Museum
 Jing Chen
 ODCSSS 2006
 Supervisor: Dr. Noel O'Connor

<p>Background:</p> <ul style="list-style-type: none"> National Museum of Ireland (NMI) has 4-5 million artifacts - display problem Laser scanner - too expensive No commercially available 3D search system <p>Motivation:</p> <ul style="list-style-type: none"> To develop an approach to digitize museum artifacts supporting Low-cost Efficient 3D view generation Combined 2D/3D search and retrieval <p>Setup Rig:</p> <ul style="list-style-type: none"> Camera Turn table Light tent 	<p>Approach:</p> <p>My Work 1:</p> <ul style="list-style-type: none"> Work: Camera calibration, Stereo image capture, Image rectification Reason: Gather camera parameters (intrinsic & extrinsic) Stereo because view interpolation to get disparity map Result: 	<p>My Work 2:</p> <ul style="list-style-type: none"> Work: Run segmentation algorithm, Run Descriptors, Parse XML & Store in database Reason: To get the 2D/3D information of artifact, Store in database for search and retrieval Result: <p>Applications:</p> <ul style="list-style-type: none"> Admin Application: Query Application:
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The "stop-action motion effect" introduced in movies such as "The Matrix" involves apparently freezing a 3D action sequence and "moving the camera around while all the actors are frozen, before resuming the action from another camera position. The DigiFact capture station is a low-cost (albeit lower quality) alternative to full 3D laser scanning of artifacts - an expensive and difficult process that can only be undertaken for the most famous/valuable of museum artifacts and not for the thousands of other artifacts in such collections. Jing developed an enduser indexing and retrieval application for this system featuring various indexing mechanisms for user-definable synthetic views of artifacts based on both 2D and 3D information.

Aidan Flanagan, University College Dublin, Ireland (ODCSSS@UCD)

Speaker Identification
 The problem of identifying a person by their speech
 Aidan Flanagan
 Supervisor: Dr. Fred Cummins

<p>Aim</p> <ul style="list-style-type: none"> To create a streamlined system that can take in a set of files from a speech corpus and output the classification results 	<p>Tools</p> <ul style="list-style-type: none"> Praat - tool with which you can analyse, synthesize, and manipulate speech Weka - a collection of machine learning algorithms for data mining tasks 	<p>Operation</p> <ol style="list-style-type: none"> Take in files from speech corpus and convert to MFCC features Convert these features to databases Classify these databases and record the results
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Forensic speaker identification involves the assignment of a probability that a sample of speech (for example a recorded phone call) came from a specified person from whom other speech samples (though not necessarily text-identical) may be obtained. This is still an unsolved task, on which many researchers are working. Researchers in UCD have collected a unique speech database in which multiple speakers are recorded in a variety of conditions. In this project Aidan used the speech corpus with a selection of tools for feature extraction. His research tested a broad range of features, and assessed their stand-alone and combined utility at identifying speakers from a set of about 40.