

## Expressive Interaction with a Surface through Fiduciary-Tagged Gloves

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The hand has incredible potential as an expressive input device. Yet most touch technologies imprecisely recognize limited hand parts, usually by inferring the hand part from the touch shapes. We introduce the fiduciary tagged glove as a reliable, inexpensive, and very expressive way to identify hand parts. Tags recognizable by the Microsoft Surface are stuck onto key hand parts (fingertips, knuckles, palms, sides, backs of the hand) on our glove. Each recognized tag returns an id, coordinates, and orientation information. This allows the simple and reliable identification of the hand part that touched the surface. Hence, separate functions can be permanently assigned to separate hand parts.

By observing the distance and angle between multiple hand parts, we detect hand postures. Examples are a straight hand, L-shaped postures or a fist with the tags on the side of the hand.

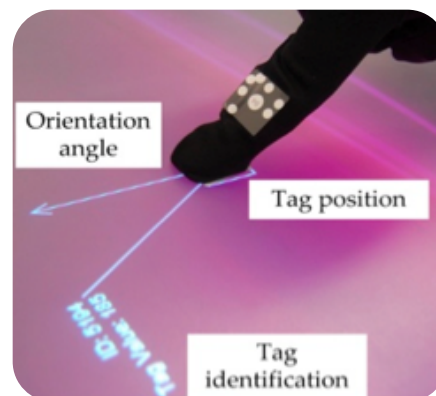
Identifying gestures is done by tracking the changes in the position and orientation of each tag over time.



Importantly, the unique identification of each part of the hand allows limiting the recognition of certain gestures to only particular fingers or parts of the hand. For instance, a swipe gesture is recognized only if performed with the side of the hand.

Each glove can be associated to one of the hands of a person. Therefore the system can discriminate between one person's or multiple peoples' hands. This also eliminates the risk of interference between simultaneous touches.

An API is currently under development that will enable other researchers to use our glove in their



own applications.

For the full article, go to <http://www.nsercsurfnet.ca/pmwiki.php?n=SurfNet.Papers>

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Happy Birthday  
SurfNet!

SurfNet celebrates its  
first birthday

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## A Multi-Agency Collaboration and Coordination Hub (MACCH)

By Stacey Scott,  
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Waterloo Regional REACT (REACT) is a volunteer-based emergency services organization that provides support and assistance to the general public at community-sponsored events, and assists other emergency services during emergencies. The Collaborative Systems Laboratory at the University of Waterloo is undertaking a project (called MACCH) to assist REACT by developing technology that will aid their operations during these events. This project falls under the SurfNet application area "Planning, Monitoring, and Control

Environments".

A critical piece of equipment used by REACT is the mobile Command Centre, which acts as a hub from which operations are directed. For example, during community-sponsored events REACT field agents patrol the location while a central command monitors and directs field agent activity from within the Command Centre. During emergencies, a similar command role may be taken by a member of an emergency services organization, who would monitor and direct the actions of members in the field.

Currently, the monitoring of activity outside the Command Centre is conducted entirely through radio communications. The aim of the

MACCH project is to develop alternative methods for both REACT and emergency services personnel to access and share information. The first phase of this project is to develop suitable surface computing hardware and software interfaces to support communication and coordination activities. Specifically, command personnel will have access to geospatial information on a very user-friendly interface, which enables REACT volunteers to use it without needing prior training. An initial concept sketch of the proposed design solution is shown. Later phases of the MACCH project will examine other technology applications which can be used to further improve REACT's operations.



## Happy Birthday SurfNet!

On February 1st we celebrate our first birthday. Highlights from this past year include:

### Our first annual SurfNet 2010 Workshop and Industry Open House

- ▶ Our 2010 Workshop had around 80 attendees from across Canada, the US, France, UK and Austria
- ▶ Our Industry Open House attracted over 120 people who viewed over two dozen demos

### Great showing at the 2010 ACM International Conference on Interactive Tabletops and Surfaces in Saarbrücken, Germany

- ▶ Best Paper awarded to SurfNet researchers
- ▶ SurfNet researchers were involved with 7 out of 32 technical papers and notes

### Strong Network growth

- ▶ Over 50 network trainees
- ▶ Over 60 current projects
- ▶ Over 39 Industrial/Organizational partners, with more than 15 actively involved in current projects
- ▶ 9 collaborating researchers from around the world and growing

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