The Survivor Buddy Project: Affect in Robot-Assisted Medical Response

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http://www.ieee-ras.org

• RAS fellowships for students
• Mentoring for students, junior faculty, and women/minorities
• Technical Committee on Safety Security Rescue Robotics
• IEEE Workshop on Safety Security Rescue Robotics
Robin Murphy: Roboticist to the Rescue

by David Schneider

This profile is part of 2009 Spectrum’s Special Report on Dream Jobs 2009.

ROBOT MENAGERIE: Robin Murphy, an IEEE member, shows off her robots at a train wreck staged for rescue drills.

Dream Jobs 2009

1 September 2001 was a proud day for robotics expert Robin Murphy. It marked the opening of the Center for Robotic-Assisted Search and Rescue, which was aimed at proving an idea that Murphy and one of her former graduate students had been pushing for six years: that intelligent robots could help save lives at disaster sites.
Emergency Informatics

the real-time collection, processing, distribution, and visualization of information for prevention, preparedness, response and recovery from emergencies
Texas A&M Engineering College

- Undergrad program
  Ranked 9th
- Grad ranked 7th by US News and World Report
- 7,500 undergrads, 2,500 graduate students
- 400 faculty
- 3rd in Eng. Research $$ (MIT, GT)
Computer Science & Engineering

- Grad program Ranked 15th by US News and World Report
- 600 undergrads
- 300 graduate students
- 46 faculty
Disaster City
Robots Deployed in USA

- 9/11 World Trade Center (2001)
- California Mudslides (2005)
- Hurricane Katrina (2005)
- Hurricane Rita (2005)
- Hurricane Wilma (2005)
- Sago Coal Mine (2006)
- Midas Gold Mine (2007)
- California wildfires (2007)
- Crandall Canyon Coal Mine (2007)
- Berkman Plaza II (2007)
- *Plus unconfirmed report of wilderness in North Dakota*
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GROUND VEHICLES

VICTIM MANAGEMENT
Victim Management
Joint Cognitive System (Woods)
Traditional HRI Focus

Yanco Goodrich Brummer Murphy and Burke
CBIRF Victim Transport
What About the Survivor?

Vecna BEAR
Oh
What About the Survivor?

Riddle, Murphy, Rasmussen
VECNA BEAR
The Media Equation

- Reeves and Nass
  Media=Real Life
Empirical Support

• Fincannon, Barnes, Murphy et al
• Soldier attachment to Packbots
Victim Management Ramifications of Mediated Relationship

• Will expect a socially consistent relationship
  – Proxemic behaviors

• Will identify with the robot as a discrete, independent agent (social actor) even if clearly being teleoperated
  – Identity, “voice”
Plus…. Ballad of The Beaconsfield Miners
Survivor Buddy
Web-Based Media Changes the Mediated Relationship

• Will expect a socially consistent relationship
  – Proxemic behaviors

• Will identify with the robot as a discrete, independent agent (social actor) even if clearly being teleoperated
  – Identity, “voice”

• *Is also a pure medium*
New Position on Identity Spectrum?

Social Actor   Social Medium   Pure Medium

Identity
Some Dimensions of Congruence

- Non-verbal, non-facial affect
- Communication identity
- Communication voice
Affect

• Non-verbal, non-facial affect
  – NSF Fellow Cindy Bethel
  – Heuristics based on proxemics

• Communication identity

• Communication voice
Current Work

• Non-verbal, non-facial affect

• Communication identity
  – Microsoft Research HRI
  – Prof. Cliff Nass, Victoria Groom Stanford

• Communication voice
Phase 1: Videogame Simulation

- Player is the victim
- Robot “talks” in one of 3 identities
  - “This is the controller”
  - “I have a message from the controller for you:
    - “This is the robot”
- Makes suggestions about what to watch
- If player takes suggestions, likes the robot, shows less anxiety, then that identity is more congruent
Phase 2: Field Trials

Victim
Social Interaction Plus Mediation
Future Work

• Non-verbal, non-facial affect
  – Anthropomorphic vs. non-anthropomorphomic

• Communication identity
  – Multiple people interacting (medical, structural, …)

• Communication voice
  – NSF grant submitted
The Team

- Texas A&M
  - Robin Murphy (CSE), Aaron Rice
  - Takis Zourntos (ECE), Aaron Hall
- Stanford
  - Cliff Nass (COM), Victoria Groom, Kim Anderson, Caitlin Reynolds, and Matt Paden
- University of South Florida
  - Cindy Bethel, Jeff Craighead