



Communications Technology Group

WIRELESS ENABLED REMOTE CO-PRESENCE (WERC)

Chad Clemens & Stephen Powers

Eleventh Annual School of Science, Engineering, and Health Symposium

May 2, 2014

Presentation Overview

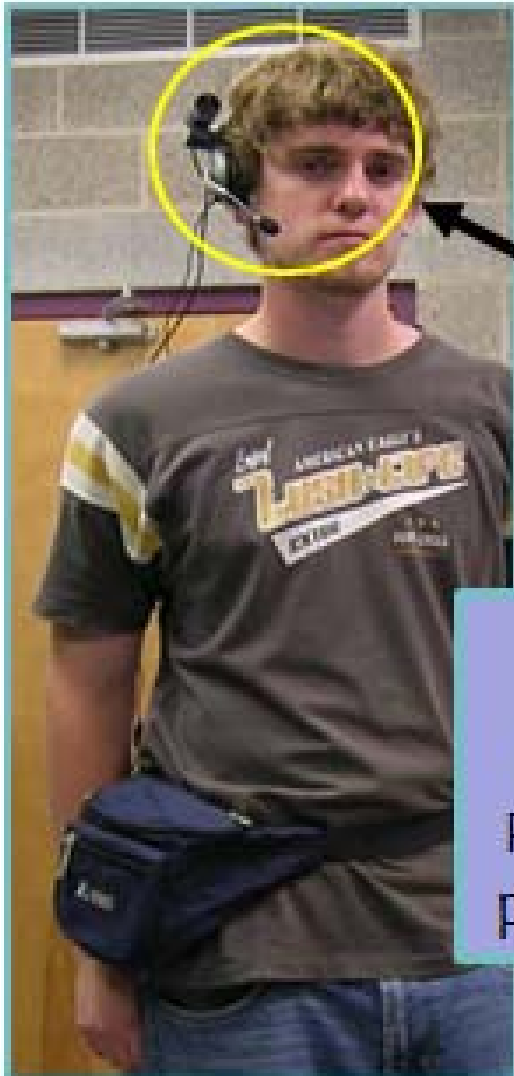
- Project background
- Recent project work
- Future project goals

Project Background

- Project Motivation
- Overall Objective



History



2011
V. 1.2
PC-based
prototype



Android Shift



2013-2014 Project Goals

- StressAlyrter
 - Ehealth Sensors
 - Q-Sensor
 - Testing
 - Application Programming Interface
 - Voice and Artificial Neural Networks

StressAlyrter

StressAlyrter will be able to trigger an Automated Stress Meltdown Intervention—while alerting to summon personal support

The screenshot displays the StressAlyrter interface with four employee monitoring panels and a training schedule. Each panel includes a video feed, a name label, a stress level indicator (a color bar with a double-headed arrow), and status for Headset, Bio, and Camera. The panels are for Taniqua (Fashionista), Tyler, Taniqua, and Anash. A fifth panel shows a video of Taniqua Smale with her name, location (Fashionista Outlet, Howard Valley Mall), and counts (IND: 5, PROF: 4). The training schedule shows activities from 08:00 to 04:00, including 'Initiate Client Contacts', 'Await coach contact', 'LUNCH', and 'TRAINING: Op Cash Register'. A red box highlights the 'TRAINING: Op Cash Register' activity and a text box containing the 'Taniqua cool-down protocol'.

Taniqua cool-down protocol:

1. Think the names of your five cousins
2. Watch the other person's chin, not their eyes
3. Look surprised, as if you just remembered something important and say, "Would you please excuse me ma'am/sir, I'll be right back."

Ehealth Sensors

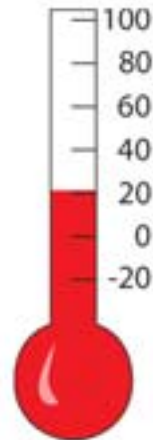
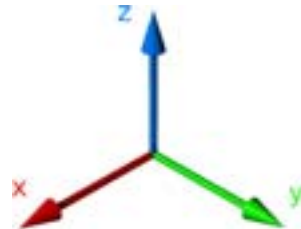


Q-sensor

- Worn around wrist
- Galvanic Skin Response
- Collects and then viewed after currently



Q-sensor

A screenshot of the Bluetooth Viewer (LITE) app interface. The app is connected to a device named 'AffectivaQ-v2-203S'. The screen displays a list of data points, each consisting of eight numerical values. The data points are as follows:

Index	Value 1	Value 2	Value 3	Value 4	Value 5	Value 6	Value 7	Value 8
7	-0.63	-0.86	0.02	4.08	29.3	0.045		
8	-0.63	-0.86	0.02	4.09	29.3	0.045		
9	-0.65	-0.82	0.04	4.08	29.3	0.045		
C	-0.66	-0.85	0.09	4.08	29.3	0.045		
0	-0.65	-0.80	0.10	4.08	29.3	0.045		
1	-0.67	-0.82	0.31	4.09	29.3	0.045		
2	-0.68	-0.88	0.45	4.09	29.3	0.045		
3	-0.67	-0.86	0.44	4.08	29.3	0.045		
4	-0.66	-0.88	0.45	4.08	29.3	0.045		
5	-0.65	-0.87	0.44	4.08	29.3	0.045		
6	-0.68	-0.84	0.41	4.08	29.3	0.045		
7	-0.67	-0.82	0.40	4.08	29.3	0.045		
8	-0.67	-0.82	0.44	4.08	29.3	0.045		

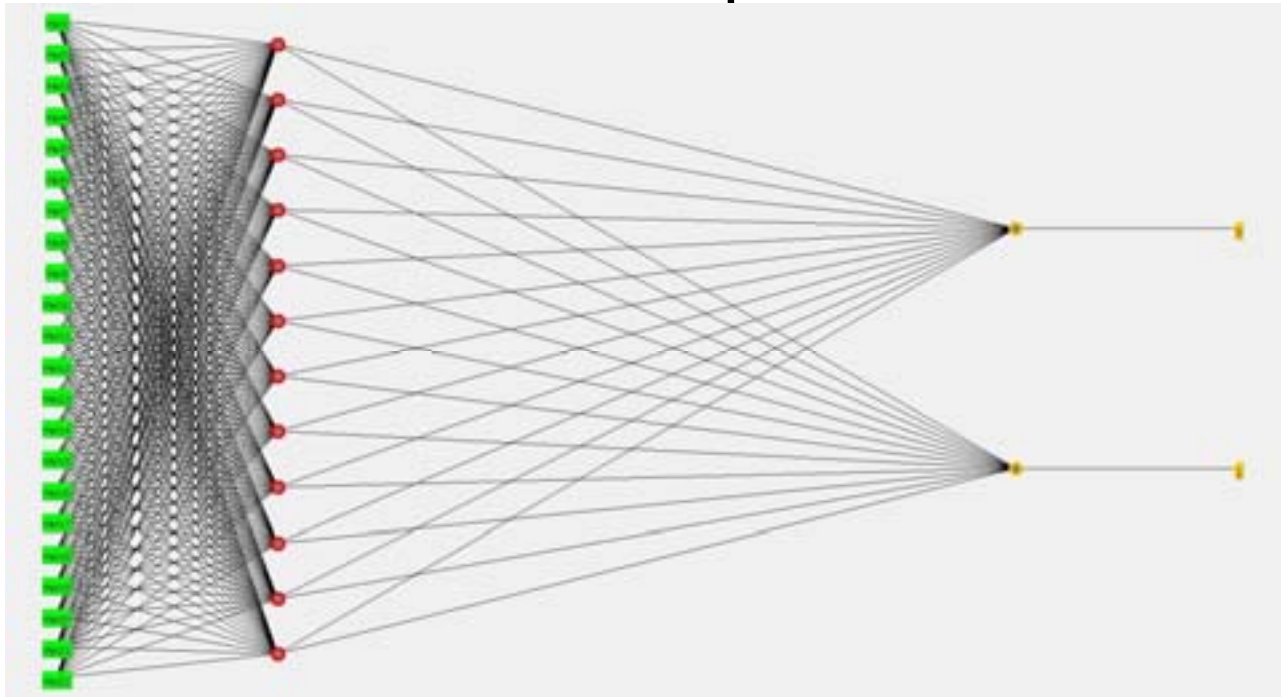
The interface includes a 'Send' button at the bottom right and a status bar at the top showing the time as 10:40.

Q-Sensor



Voice & ANN

- Need for a discriminator → Voice
- Use an artificial neural network to learn the differences and then predict outcome

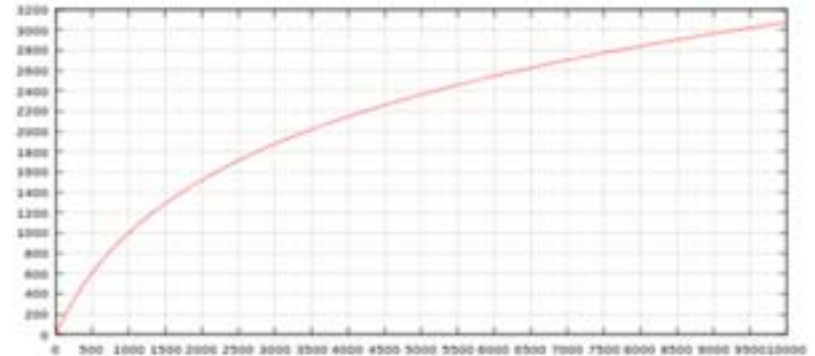


Neural Networks

- Process of using artificially created neurons as predictors
- They are taught using some of the collected data, and then can make predictions
- Taught through backpropagation

Neural Network Process

- Sample collection
- Sample transformation and gathering of needed energies
- File conversion
- WEKA: Waikato Environment for Knowledge Analysis
- 95% success rate



Outcomes

- Q-sensor test runs completed
- Ehealth sensors investigated
- API progress
- Neural Network successfully completed as stepping stone

Future Goals

- Finish API for Q-sensor integration
- Run tests using a neural network and positive/negative stress samples as the inputs
- Automatic Shutoff Solution

Acknowledgements

- Kelly Kulp '15
- Andrew Cameron '17
- Kelly Schwiker '17
- Ryan Hahn '17
- Mr. Curt Byers & Symbionyx Corp.
- Dr. Harold Underwood
- Dr. Gene Chase
- Dr. Randy Fish
- Dr. David Owen
- Dr. Nancy Patrick

Questions?

