


## About Affective Media

Affective Media  are considered leaders in the development of emotion detection technologies. They are working with the mobile and animation industry to create emotion tracking systems for automated character animation, with the call centre and sales sectors for customer satisfaction and agent performance measurement, and with the automotive industry on improving car safety. They are one of the 2003 Scottish spin out company of the year award winners.

## MSc Project List 2004/2005

### Lie detection / fraud detection

Fraud detection is the current buzzword. Many insurance companies are turning to anti-fraud teams to reduce the number of fraudulent claims and buying into the concept of voiced based lie detection or voice risk analysis.

By assessing the emotional, cognitive and physiological patterns in the spoken word and accurately measuring the frequency patterns of vocal segments of conversations it is possible to detect fraudulent claims. It is difficult for a fraudster, because he or she does not have emotions about the event because it's not a genuine event. All they have is the hub of the story, without reactions or emotions. Furthermore, a fraudster will often speed up and rush out their stories and are also likely to become increasingly aggressive. They particularly like to treat young females at call centres with aggressive tactics. The project will consider the current industrial solutions to voice lie detection and build upon this standard to improve successful detection of lies and fraudulent claims. The developer will benefit from having access to novel emotion detection technologies and working with Affective Media. The project is suitable to a student with good programming abilities and an interest or knowledge of speech analysis.

### Biometric emotion detection

Your emotional mood can be determined by sensing your physical state or behaviour. Using sensors researchers can gather data on the galvanic skin response (skin's conductance to detect sweating), blood volume pulse (blood pressure and pulse rate), respiration (depth of breath and rate of breathing) and electromyogram (muscle contraction). By modelling these data traces to emotional states we can automatically detect emotions and moods. The project will begin by considering the current physiological characteristics associated with biometric emotion detection and develop simple sensors. The project will consider commercial applications for biometric emotion detection (such as emotional CD players) and develop working prototype systems. Commercial and technical guidance will be provided by Affective Media. The project is suitable to a student with good programming abilities and an interest or knowledge of HCI and DSP.

### Next generation acoustic emotion detection

Emotional cues are present in not only the words we speak but also how we speak them. For example, the pitch of our voice tends to change in response to whether we are happy or angry. Affective Media has been leading the industry in analysing speech patterns to automatically detect mood and emotion. The project will research into

the current thinking and findings of how we exhibit emotions and mood in our voice. The project will then develop new algorithms which will be incorporated into Affective Media's leading edge technology or create an adaptive system which can improve emotional recognition performance over time.. The project is suitable to a student will good programming abilities, an interest or knowledge of speech analysis and/or DSP and a desire to work on a novel and commercially exciting project.

### **Emotive gaming (can run multiple projects for different genres of gameplay)**

Online and multiplayer gaming is appearing on all platforms. Although the environment graphics and the realism of the characters continue to greatly improve the emotional engagement with the games are still limited. The project will develop a game in which the gameplay and the game characters react to the player's emotional state. This may be that the player must motivate their troops before going into battle, as a manager shout at your football team at half time because they are loosing or chat up the barperson to gain value information in a roleplaying game. The project may use an existing gaming platform such as Quake to develop the emotional game or develop a novel gaming environment similar to EyeToy and SingStar. The student should think about the type of game they wish to consider eg car racing/simulator or first person shoot-um-ups. Suitable to those with very good programming skills.

### **Emotional intelligence**

Emotional intelligence is the ability to use your emotions to help you solve problems and live a more effective life. There is a lot of interest currently in emotional intelligence from commerce as a solution to management and team-working, however more than that emotional intelligence can reduce stress and improve personal wellbeing. The project will look at how we can use emotional intelligence to improve the state of mind of users, by for example interaction with virtual characters, emotive sounds and images, empathetic questions and biofeedback. Suitable to those with interest in psychology.

### **Emotional responsive toys/robotics**

Detecting emotion in humans is only one part of the puzzle. How you respond to the known emotion makes emotional technologies intelligent. The project will consider how to respond to emotional humans. This could include a child's toy which responds to the child's boredom, frustration or happiness by asking the child to play, helping the child with a task or laughing respectively. The student could make use of existing children's toys (eg get up and dance Tigger) or using Lego Mindstorms to develop prototypes of emotionally responsive systems.

### **Getting natural emotions in a recording environment**

Emotional technologies are in their infancy. Currently there is considerable interest both academically and commercially in developing emotionally intelligent and responsive systems. Unfortunately unlike speech recognition there are no standard databases of emotive speech examples on which to train and compare system performance. Affective Media has compiled its own database of emotive speech however there are problems in attempting to induce people into emotional states or using actors to create emotions. This project will allow the student flexibility in designing an environment in which to make human participants highly emotional and thus allowing recording of good quality emotive examples. In addition to requiring

good programming skills the project could be suitable to those with interest in psychology and social behaviour.

### **Regional accents and their affect of emotion**

Affective Media has found that regional accent has an affect on the emotional characteristics of speech. In attempting to train an automated emotion recognition systems it is necessary to find baselines of emotion for the human population. However some accents such as 'the Midlands' can be detected a more downbeat and bored whereas others such as 'Glasgow' detected as more aggressive. The project will consider the link between the perceived emotional state of regional accents and their affect on achieving automated emotion recognition systems. In addition to requiring good programming skills the project could be suitable to those with interest in psychology and speech analysis.

### **Your ideas for emotional prototypes and applications**

We have presented a range of applications for emotionally intelligent systems including gaming, mobile comms, robotics and toys etc. If however you have an interesting and novel idea for emotional technology then please feel free to contact Affective Media. You may want to develop wedding rings which when one is rubbed the other heats up to allow married couples to show each other affection every when miles apart. You may want to develop mobile phones which you can squeeze if angry and the recipients mobile turns red. We may well be able to configure your idea into a project to satisfy your interests.