COMLEX: Visualizing Communication for Research and Saving Lives

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Communication failure is a major contributor to 40% of adverse patient events…

… and 70% of those that cause serious harm

Hospitals harm up to one in six patients

In Australia, communication has been attributed as the major cause for 1,500 deaths per year

While hospitals now have good simulators for practicing operations, there is little equivalent technology for medical communication skills

The problem

An existing training exercise

Expensive (expert’s time), few episodes

One way of performing more exercises

Running experiments with our tool early 2010

Which raises the questions…

How can a machine tell if something has or has not been communicated? What kinds of machine analysis are useful in practice? How can machine analysis be presented meaningfully and credibly to non-scientists?

Repository and workflow

Simple RESTful repository stores data
Plug-ins access data and produce more data.
(eg, transcript from sound, human-corrected transcript from transcript, topic-map from transcript, cognitive load from sound, affect from video.)
Workflow defined using BPM tools, and can include human steps (eg, correcting a transcript).
Designed for integrating many AI/NLP analyses

Visualization client

Handles differences in axis between tracks (eg, time vs utterance vs colonoscopy distance)
OSGi plug-in API, supporting Swing and JavaFX
Template configurations for deployment
“Heuristic advice” is a visualization
Making it easy to experiment with visualizations

The tool in practice…

Communication researchers
Makes it easier to use many technical analyses on an episode.
Find common failure modes in clinical communication.
We would like to determine “objective measures of communication.

AI, NLP, HCI researchers
Experiment with analysis and visualization
What is useful to non-scientists?
What computable aspects of communication can be credibly depicted to non-technical users?

Medical professionals
Self-review in training exercise
Professional review of clinical shift hand-over meetings
Forensic tracing of communication from patient interaction through a shift-change to another interaction

We are using the tool we have developed for experiments with the training exercise and for comparison of think-aloud recordings in 2010. We will be experimenting with professional review of clinical group meetings in 2011.

We hope you will also consider integrating your analysis modules or creating new visualizations.

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From imagination to impact