

Understanding Multiparty Interaction

Challenges from
Instrumented Meeting Rooms

Steve Renals
and AMI Project colleagues

www.amiproject.org

Understanding interaction

Multimodal
Processing

Signal
Processing



Social
Psychology

Multiparty
Collaboration



Instrumenting meetings



Understanding the interactions

- Unconstrained speech recognition
- Non-verbal communication
- Attention
- Social cues
- Understanding dialogues
- Individual and group behaviour
- Multimodal signals, multiparty communication

AMI Corpus

- AMI Corpus - 110 hours of meeting recordings
- Annotations
 - speech transcription
 - Linguistic: topics, summaries, dialogue acts, ...
 - Multimodal: hand gestures, head pose, head gestures, person location
- Automatic annotations: ASR output, topic segments, ...
- Freely available – <http://corpus.amiproject.org/>

Machine learning issues

- Scalability
- Sequential data
- Mixture of discrete and continuous data
- Multiple streams of overlapping data
- Multiple simultaneous sources
- Strong reliance on supervised methods... but annotation is expensive
- Generative models and discriminative models

Audio Processing

- Unconstrained speech recognition
 - conversational, spontaneous speech
 - multiple overlapping talkers
 - microphone arrays
- Speaker diarization - who spoke when
- Speech separation, localization, tracking
- Machine learning and signal processing

Multimodal processing

- Audio-video speaker tracking
- Combine transcription, prosody, video features, speaker turn information to extract content
- Segmentation - dialogue acts, topics, meeting phases
- Summarization using lexical and prosodic information
- Automatic recognition of subjective content (eg positivity and negativity)

Challenges

- Domain adaptation
- Unsupervised learning
- Larger groups, longitudinal data
- Social signals, social role, social networks
- Richer linguistic modelling
- Lots of computer vision problems
- Evaluation

Cooperation

- You can record your meetings in the IMR!
- Provide
 - Lots of realistic annotated data
 - Well-defined ML problems / straightforward evaluations
 - Less-well-defined ML problems without straightforward evaluations
- Previous PASCAL challenge (Speech Separation) - scope for more?
- InSpace... and instrumenting the Forum