

Outline

Motivation

- domain, task, and dataset
- Current design and rationale
 - Implementation approach
 - Components of the interface
- Proposed extension
 - Implementation status



Domain?



- In our daily lives, we have conversations with people in many different modalities
 - Emails, meetings, telephone, videoconferencing, instant messaging, blogs, forums, etc.
 - The Web has significantly increased the volume and the complexity of <u>conversational data</u>









Task?



- High volume of conversational data being generated every day
- <u>Conversation summarization</u> can be beneficial by creating concise overviews
 - Expedite personal browsing of the data
 - Help preserve corporate memory

Possible Approaches



- Extractive summary
 - generated by selecting and concatenating the most informative sentences
 - dominant approach since simple binary classification
 - often unsatisfactory for users
- Abstractive summary
 - generated by extracting and aggregating information
 - requires a natural language generation component
 - preferred by users for coherency
 - × lacks details

Visual Interface for Browsing and Summarizing Conversations

- Browse the conversation transcript
 - guided by an ontology which aggregates sentences according to
 - entities they mention
 - the speaker of the sentences
 - dialog acts i.e. whether they express a decision, problem, action item or subjectivity (positive or negative opinions)
- Generate summaries (either extractive or abstractive)
 - that can be tailored to concepts selected from the ontology

Ontology Mapping Example

- A: Let's go with a simple chip.
 - Speaker A, who is the Project Manager
 - Entities: only one, simple chip
 - Dialog Acts: classified as decision and positive-subj

UTTERANCE	PARTICI	PANT	ENTITY
	PRC	DJECT-MANAG.	
Utterance5	hasSpeaker	Speaker A	simple chip
hasDAType	I	hasEntity	
	hasDAType		
decision		positive- subjective	



7

Dataset?

- Extensible to multi-modal conversations
 - AMI meetings [Carletta et al MLMI'05]
 - IBM blog discussions
 - BC3 emails [Ulrich et al AAAI EMAIL'08]
- Challenges:
 - Non-linear structure of emails



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Implementation Approach

Python

- Data parsing and formatting
- Mapping to ontology concepts and relationships

Java

- Frontend interface
- Abstractive summary generation

Interface for Browsing and Summarizing Conversations

Utterance (416)	Tags	Utterance
🔶 🔄 🚍 Participant (416)		Okay,
		good morning . This is our first team meeting .
— 🔲 🔲 IndustrialDesigner (55)	and the second se	Good day .
— 🔲 ME MarketingExpert (79) 🦳 —		Good day . Morning .
PM ProjectManager (218)		Morning
UserInterfaceExpert (64		If the your Project Manager for today, for this project.
	PM	My name is Mark
- • • • • • • • • • • • • • • • • • • •		will be giving this presentation for you to kick the project off.
		That's my uh
- 🗹 🕐 Decision (41)		that's the agenda for today .
— 🗌 🕐 NegativeSubjective (83)	PM	of course we're new to each other ,
- 🕑 🕂 PositiveSubjective (83)		so I'd like to get acquainted first.
— — (#) Problem (41)		So lefs do that first,
Y Entity		Imean
- 🗹 🗋 agenda		Let's start with you ,
		can you introduce yourself?
- animal	1 10 2	You're our Marketing Expert
- 🔲 🗋 animals		Yes . Um my name is Dirk . Dirk Meinfeld .
- 🔲 🗋 answer		Um my name is Dirk, Dirk Meinteig. Um I will be uh Pr Project the Marketing Expert .
- 🔲 🗋 anything		And I will see what the user wants
- 🗆 🗋 apparatus		and uh what we can do uh with the new produ project product.
- C heautiful animal	PM (+)	Okay, excellent.
Deaution annian		And you are User Interface
4 Park chaot		Nick Broer,
ProjectManager	So let's do that first ,	
ProjectManager	I mean	
ProjectManager	Let's start with you ,	
ProjectManager	can you introduce yourself?	
ProjectManager	You're our Marketing Expert .	
MarketingExpert MarketingExpert		
MarketingExpert		
ProjectManager	Okay, excellent.	te new product product.
ProjectManager	And you are User Interface	
	pert User Interface Designer .	
ProjectManager	Yeah.	
		nical design from the uh user point of view .
ProjectManager	Excellent . Okay .	
IndustrialDesign	er I'm the Industrial Designer,	·

Ontology View



- Each node consists
 - a label
 - in parenthesis a count of sentences that can be mapped to it
 - an abbreviated string or icon representing the node
- Colored icons of different shapes as visual cues

Transcript View



Tags	Utterance	
PM	Okay,	-
	good morning .	4
PM	This is our first team meeting .	
	Good day .	
	Morning .	
	Morning .	
	I'll be your Project Manager for today , for this project .	
	My name is Mark	
	will be giving this presentation for you to kick the project off.	
	That's my uh	
	that's the agenda for today .	
	Well,	
	of course we're new to each other ,	
PM (?)	so I'd like to get acquainted first .	
	So let's do that first ,	
	Imean	
	Let's start with you ,	
	can you introduce yourself ?	
[PM (!)	You're our Marketing Expert .	
	Yes.	
	Um my name is Dirk , Dirk Meinfeld .	
	Um I will be uh Pr Project the Marketing Expert	
	And I will see what the user wants	
	and uh what we can do uh with the new produ project product .	
	Okay, excellent.	
	And you are User Interface	
	Nick Broer,	-

- One sentences per row
- Turns indicated by containment



Summary View

ProjectManager	So let's do that first .
ProjectManager	Imean
ProjectManager	Let's start with you ,
ProjectManager	can you introduce yourself?
ProjectManager	You're our Marketing Expert.
MarketingExpert	Um I will be uh Pr Project the Marketing Expert.
MarketingExpert	And I will see what the user wants
MarketingExpert	and uh what we can do uh with the new produ project product .
ProjectManager	Okay, excellent.
ProjectManager	And you are User Interface
UserInterfaceExpert	User Interface Designer.
ProjectManager	Yeah.
UserInterfaceExpert	I'm going to uh look at the technical design from the uh user point of view .
ProjectManager	Excellent . Okay .
IndustrialDesigner	I'm the Industrial Designer,

• Filtered view of tagged sentences on the transcript view

• Linked with transcript view for further inspection of a particular sentence of interest

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Proposed Solution (1) : Better Representation of Ontology Concepts





- Remove technical jargon
- Scale font of labels according to count
- Separate entity from speaker and sentence
 Type
- ✓ Redesign icon
- Range slider for entity view

Proposed Solution (2) : Information Scent for Summary View

ŭ U	#787#	Yeah.	<u>]</u>
🚨 ID	#792#	Yeah.	
🚨 ID	#793#	Which are kind of hidden away in some way	1000
🚨 ID	#794#	or well not hidden but they're uh they're not as prominent as the main features .	1111
⚠	#808#	Battery ? Do we need a long-life battery ?	1000
	#809#	Battery battery use .	
	#814#	So you never have to change the battery .	1000
🏭 🛛 🔔	#816#	We should maybe investigate whether it needs a battery at all .	
🊨 ID	#817#	I suspect the remote control does need a battery,	
🚨 ID	#818#	but	
🚨 ID	#821#	I dunno if you can	
<u>R</u> IN	#824#	Yeah	
•			1.21



Proposed Solution (3) : Marker Bar



65

66

67

68 69

70

71 72

73

0

75 76

77

78

79

80 81

82

83

Multiple tags applied to a row

```
setCorpusType(type);
9
             InstanceDataParser idp = null;
             TranscriptParser tp = null;
             EntityListParser elp = null;
             PosTagParser ptp = null;
             ExcludedEntityListParser eelp = null;
             if(corpusType==1)
             Ł
                 idp = new MeetingInstanceDataParser(dirName + "/" +***+ Data
                 tp = new MeetingTranscriptParser(dirName + "/" + DataSetting
                 elp = new MeetingEntityListParser(dirName + "/" + DataSettir
                 ptp = new MeetingPosTagParser(dirName + "/" + DataSettings.
                 eelp = new MeetingExcludedEntityListParser(dirName +
                                                                       "/" +
             else if(corpusType==2)
                 idp = new IBMInstanceDataParser(dirName + "/" + DataSettings
                 tp = new IBMTranscriptParser(dirName + "/" + DataSettings.ge
                 elp = new IBMEntityListParser(dirName + "/" + DataSettings.
84
```

Proposed Solution (4): Others



Flexibility for searching Incorporate speaker as turn parameter

	Morning .
	Morning .
PI	I'll be your Project Manager for today, for this project.
PI	My name is Mark
PM	Will be giving this presentation for you to kick the project off.
PI	
PI	that's the agenda for today.
PI	Well,
PI	of course we're new to each other,
PM	oso I'd like to get acquainted first
PM (?	So let's do that first.
PI	l mean
PM	OLet's start with you ,
	Can you introduce yourself?
PM	OYou're our Marketing Expert.
	Yes.
	Um my name is Dirk, Dirk Meinfeld.
	Um I will be uh Pr Project the Marketing Expert.
	And I will see what the user wants

 Redesign speaker icons to be more semantically intuitive







Thank You

Questions?

References



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