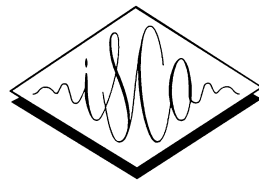


SIGDIAL 2020



**21th Annual Meeting of the  
Special Interest Group on Discourse and  
Dialogue**



**Proceedings of the Conference**

01-03 July 2020  
1st virtual meeting

**In cooperation with:**

Association for Computational Linguistics (ACL)

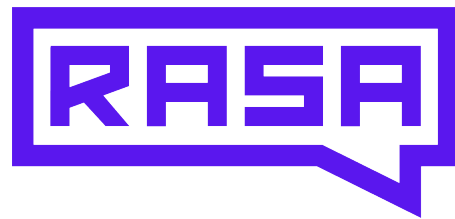
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## Introduction

We are excited to welcome you to SIGDIAL 2020, the 21st Annual Meeting of the Special Interest Group on Discourse and Dialogue. This year the conference is being held virtually, on July 1-3, 2020, with the Satellite Event YRRSDS 2020 (Young Researchers' Roundtable on Spoken Dialog Systems) and just before ACL 2020 that will take place also virtually July 5-10, 2020.

The SIGDIAL conference is a premier publication venue for research in discourse and dialogue. This year, the program includes three keynote talks, nine presentation sessions, three demo sessions, and a special session entitled "Situating Dialogue with Virtual Agents and Robots (RoboDial 2.0)" organized by Jose David Lopes, Stephanie Lukin, Matthew Marge, Vikram Ramanarayanan, Matthias Scheutz, Casey Kennington, and Cynthia Matuszek.

We received 104 submissions this year, which comprised 62 long papers, 32 short papers and 10 demo descriptions. This year, for the first time, we had 8 Senior Program Committee (SPC) members who were responsible for a set of 10-15 papers each, guiding the discussion process and writing a meta-review. Every submission was assigned to one SPC and received at least three reviews. When making our selections for the program, we carefully considered the reviews, meta-reviews and the comments made during the discussions among reviewers. The members of the Senior Program Committee and Program Committee did an excellent job in reviewing the submitted papers, and we thank them for their essential role in selecting the accepted papers and helping produce a high quality program for the conference. In line with the SIGDIAL tradition, our aim has been to create a balanced program that accommodates as many favorably rated papers as possible. We accepted 41 papers: 23 long papers, 10 short papers, and 8 demo descriptions. These numbers give an overall acceptance rate of 39%. The acceptance rate for long papers (37%) and short papers (31%) remains in line with the acceptance rate from last year.

Each of the three conference days features one keynote and several oral sessions, with the remaining time given to demos, special session and sponsor sessions. In organizing the virtual conference, we decided to keep as much as possible the spirit of an in person conference. All keynotes, talks and demos are pre-recorded and made available at the beginning of the conference for participants to watch asynchronously. The long and short papers are organized in thematic sessions and take into consideration the speakers' different time zones. The sessions contain 3-4 pre-recorded talks followed by a Live QA part with the presenters. For demos, we organized Live Question Answering sessions with the demo presenters. Topic-wise, we have papers on evaluation and corpora, natural language generation, task oriented dialogues, knowledge use and acquisition, behaviour modeling, dialogue policy and dialogue state tracking, modeling convergence in dialogues, and the semantics and pragmatics of discourse and dialogue.

A conference of this scale requires advice, help and enthusiastic participation of many parties, and we have a big 'thank you' to say to all of them. Regarding the program, we thank our three keynote speakers, Asli Celikyilmaz (Microsoft Research), Diane Litman (University of Pittsburgh) and Gabriel Skantze (KTH Royal Institute of Technologies), for their inspiring talks on "Neural text Generation: Progress and Challenges", "Argument Mining, Discourse Analysis, and Educational Applications" and "Conversational Turn-taking in Human-robot Interaction". We also thank the organizers of the special session on Situating Dialogue with Virtual Agents and Robots (RoboDial 2.0). We are grateful for their smooth and efficient coordination with the main conference.

We extend special thanks to our Local Chair, Casey Kennington, for handling the situation of adapting to a virtual conference. SIGDIAL 2020 would not have been possible without his effort in arranging the virtual platform, handling registration, numerous preparations for the conference, and last but not least, Casey's personal contributions, which exceeded those of a local organizer. We also thank the virtual presentation co-chairs, Koji Inoue and Erik Ekstedt, for helping the authors with their video

presentations, arranging for the video streaming during the conference and hosting the Zoom Live QAs sessions.

David Vandyke, our Sponsorship Chair, has conducted the massive task of recruiting and liaising with our conference sponsors, many of whom continue to contribute year after year. We thank David for his dedicated work and his assistance with conference planning. We gratefully acknowledge the support of our sponsors: (Gold level) Apple and Rasa Technologies and (Silver level) Toshiba Research Europe and Honda Research Institute.

In addition, we thank Nina Dethlefs, Mentoring Chair for SIGDIAL 2020, for her dedicated work on the mentoring process. The goal of mentoring is to assist authors of papers that contain important ideas but require significant stylistic modifications, and we thank our mentoring team for their excellent support of the authors; and Stefan Ultes, our publication chair, capped the long organizational process by putting together these high quality conference proceedings.

We thank the SIGdial board, both current and emeritus officers, Gabriel Skantze, Mikio Nakano, Vikram Ramanarayanan, Ethan Selfridge, Jason Williams and Amanda Stent, for their advice and support from beginning to end.

We once again thank our senior program committee members (Dilek Hakkani-Tur, Annie Louis, Mikio Nakano, Rebecca J. Passonneau, Gabriel Skantze, Manfred Stede, David Traum, Koichiro Yoshino) and program committee members for committing their time to help us select an excellent technical program. Finally, we thank all the authors who submitted to the conference and all conference participants for making SIGDIAL 2020 a success and for growing the research areas of discourse and dialogue with their fine work.

Olivier Pietquin, General Chair

Smaranda Muresan and Yun-Nung (Vivian) Chen, Program Co-Chairs



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**Invited Speakers:**

Asli Celikyilmaz, Microsoft Research, USA  
Diane Litman, University of Pittsburgh, USA  
Gabriel Skantze, KTH Royal Institute of Technology, Sweden

## Table of Contents

<i>Semantic Guidance of Dialogue Generation with Reinforcement Learning</i> Cheng-Hsun Hsueh and Wei-Yun Ma .....	1
<i>Counseling-Style Reflection Generation Using Generative Pretrained Transformers with Augmented Context</i> Siqi Shen, Charles Welch, Rada Mihalcea and Verónica Pérez-Rosas .....	10
<i>Learning from Mistakes: Combining Ontologies via Self-Training for Dialogue Generation</i> Lena Reed, Vrindavan Harrison, Shereen Oraby, Dilek Hakkani-Tur and Marilyn Walker .....	21
<i>TripPy: A Triple Copy Strategy for Value Independent Neural Dialog State Tracking</i> Michael Heck, Carel van Niekerk, Nurul Lubis, Christian Geishauser, Hsien-Chin Lin, Marco Moresi and Milica Gasic .....	35
<i>Conversational Agents for Intelligent Buildings</i> Weronika Sieińska, Christian Dondrup, Nancie Gunson and Oliver Lemon .....	45
<i>Retico: An incremental framework for spoken dialogue systems</i> Thilo Michael .....	49
<i>MC-Saar-Instruct: a Platform for Minecraft Instruction Giving Agents</i> Arne Köhn, Julia Wichlacz, Christine Schäfer, Álvaro Torralba, Joerg Hoffmann and Alexander Koller .....	53
<i>ConvoKit: A Toolkit for the Analysis of Conversations</i> Jonathan P. Chang, Caleb Chiam, Liye Fu, Andrew Wang, Justine Zhang and Cristian Danescu-Niculescu-Mizil .....	57
<i>Commonsense Evidence Generation and Injection in Reading Comprehension</i> Ye Liu, Tao Yang, Zeyu You, Wei Fan and Philip S. Yu .....	61
<i>Identifying Collaborative Conversations using Latent Discourse Behaviors</i> Ayush Jain, Maria Pacheco, Steven Lancette, Mahak Goindani and Dan Goldwasser .....	74
<i>A Case Study of User Communication Styles with Customer Service Agents versus Intelligent Virtual Agents</i> Timothy Hewitt and Ian Beaver .....	79
<i>It's About Time: Turn-Entry Timing For Situated Human-Robot Dialogue</i> Felix Gervits, Ravenna Thielstrom, Antonio Roque and Matthias Scheutz .....	86
<i>Learning Word Groundings from Humans Facilitated by Robot Emotional Displays</i> David McNeill and Casey Kennington .....	97
<i>Learning and Reasoning for Robot Dialog and Navigation Tasks</i> Keting Lu, Shiqi Zhang, Peter Stone and Xiaoping Chen .....	107
<i>An Attentive Listening System with Android ERICA: Comparison of Autonomous and WOZ Interactions</i> Koji Inoue, Divesh Lala, Kenta Yamamoto, Shizuka Nakamura, Katsuya Takanashi and Tatsuya Kawahara .....	118

<i>A Spoken Dialogue System for Spatial Question Answering in a Physical Blocks World</i> Georgiy Platonov, Lenhart Schubert, Benjamin Kane and Aaron Gindi .....	128
<i>rrSDS: Towards a Robot-ready Spoken Dialogue System</i> Casey Kennington, Daniele Moro, Lucas Marchand, Jake Carns and David McNeill .....	132
<i>Discovering Knowledge Graph Schema from Short Natural Language Text via Dialog</i> Subhasis Ghosh, Arpita Kundu, Aniket Pramanick and Indrajit Bhattacharya .....	136
<i>User Impressions of Questions to Acquire Lexical Knowledge</i> Kazunori Komatani and Mikio Nakano .....	147
<i>Simulating Turn-Taking in Conversations with Delayed Transmission</i> Thilo Michael and Sebastian Möller .....	157
<i>Is this Dialogue Coherent? Learning from Dialogue Acts and Entities</i> Alessandra Cervone and Giuseppe Riccardi .....	162
<i>Analyzing Speaker Strategy in Referential Communication</i> Brian McMahan and Matthew Stone .....	175
<i>Contextualized Emotion Recognition in Conversation as Sequence Tagging</i> Yan Wang, Jiayu Zhang, Jun Ma, Shaojun Wang and Jing Xiao .....	186
<i>How Self-Attention Improves Rare Class Performance in a Question-Answering Dialogue Agent</i> Adam Stiff, Qi Song and Eric Fosler-Lussier .....	196
<i>Filtering conversations through dialogue acts labels for improving corpus-based convergence studies</i> Simone Fuscone, Benoit Favre and Laurent Prévot .....	203
<i>Nontrivial Lexical Convergence in a Geography-Themed Game</i> Amanda Bergqvist, Ramesh Manuvinakurike, Deepthi Karkada and Maike Paetzel .....	209
<i>A unifying framework for modeling acoustic/prosodic entrainment: definition and evaluation on two large corpora</i> Ramiro H. Gálvez, Lara Gauder, Jordi Luque and Agustín Gravano .....	215
<i>Unsupervised Evaluation of Interactive Dialog with DialoGPT</i> Shikib Mehri and Maxine Eskenazi .....	225
<i>Towards Unified Dialogue System Evaluation: A Comprehensive Analysis of Current Evaluation Protocols</i> Sarah E. Finch and Jinho D. Choi .....	236
<i>Human-Human Health Coaching via Text Messages: Corpus, Annotation, and Analysis</i> Itika Gupta, Barbara Di Eugenio, Brian Ziebart, Aiswarya Baiju, Bing Liu, Ben Gerber, Lisa Sharp, Nadia Nabulsi and Mary Smart .....	246
<i>Agent-Based Dynamic Collaboration Support in a Smart Office Space</i> Yansen Wang, R. Charles Murray, Haogang Bao and Carolyn Rose .....	257
<i>Emora STDM: A Versatile Framework for Innovative Dialogue System Development</i> James D. Finch and Jinho D. Choi .....	261
<i>Boosting Naturalness of Language in Task-oriented Dialogues via Adversarial Training</i> Chenguang Zhu .....	265

<i>A Sequence-to-sequence Approach for Numerical Slot-filling Dialog Systems</i> Hongjie Shi .....	272
<i>Beyond Domain APIs: Task-oriented Conversational Modeling with Unstructured Knowledge Access</i> Seokhwan Kim, Mihail Eric, Karthik Gopalakrishnan, Behnam Hedayatnia, Yang Liu and Dilek Hakkani-Tur .....	278
<i>Multi-Action Dialog Policy Learning with Interactive Human Teaching</i> Megha Jhunjhunwala, Caleb Bryant and Pararth Shah .....	290
<i>Is Your Goal-Oriented Dialog Model Performing Really Well? Empirical Analysis of System-wise Evaluation</i> Ryuichi Takanobu, Qi Zhu, Jinchao Li, Baolin Peng, Jianfeng Gao and Minlie Huang .....	297
<i>Similarity Scoring for Dialogue Behaviour Comparison</i> Stefan Ultes and Wolfgang Maier .....	311
<i>Collection and Analysis of Dialogues Provided by Two Speakers Acting as One</i> Tsunehiro Arimoto, Ryuichiro Higashinaka, Kou Tanaka, Takahito Kawanishi, Hiroaki Sugiyama, Hiroshi Sawada and Hiroshi Ishiguro .....	323
<i>Adaptive Dialog Policy Learning with Hindsight and User Modeling</i> Yan Cao, Keting Lu, Xiaoping Chen and Shiqi Zhang .....	329
<i>Dialogue Policies for Learning Board Games through Multimodal Communication</i> Maryam Zare, Ali Ayub, Aishan Liu, Sweekar Sudhakara, Alan Wagner and Rebecca Passonneau .....	339



# Conference Program

*Note that all shown times are GMT-6. Please adjust the times for your local time zone.  
All presentations are pre-recorded unless stated otherwise.*

**Wednesday, 1 July 2020**

**7:30–7:45**     *Opening Remarks*

7:45–8:30     *Keynote 1: Conversational Turn-taking in Human-robot Interaction*  
Gabriel Skantze

8:30–9:00     *Keynote 1: live QA*  
Gabriel Skantze

**9:00–9:30**     *Break*

**9:30–10:20**   **Generation + Task-Oriented Dialogues (1)**

*Semantic Guidance of Dialogue Generation with Reinforcement Learning*  
Cheng-Hsun Hsueh and Wei-Yun Ma

*Counseling-Style Reflection Generation Using Generative Pretrained Transformers  
with Augmented Context*  
Siqi Shen, Charles Welch, Rada Mihalcea and Verónica Pérez-Rosas

*Learning from Mistakes: Combining Ontologies via Self-Training for Dialogue  
Generation*  
Lena Reed, Vrindavan Harrison, Shereen Oraby, Dilek Hakkani-Tur and Marilyn  
Walker

*TripPy: A Triple Copy Strategy for Value Independent Neural Dialog State Tracking*  
Michael Heck, Carel van Niekerk, Nurul Lubis, Christian Geishauser, Hsien-Chin  
Lin, Marco Moresi and Milica Gasic

**Wednesday, 1 July 2020 (continued)**

**10:20–10:45    Generation + Task-Oriented Dialogues (1) live QA**

**10:45–11:30    Demo (1) pre-recorded presentations + live QA**

*Conversational Agents for Intelligent Buildings*

Weronika Sieińska, Christian Dondrup, Nancie Gunson and Oliver Lemon

*Retico: An incremental framework for spoken dialogue systems*

Thilo Michael

*MC-Saar-Instruct: a Platform for Minecraft Instruction Giving Agents*

Arne Köhn, Julia Wichlacz, Christine Schäfer, Álvaro Torralba, Joerg Hoffmann and Alexander Koller

*ConvoKit: A Toolkit for the Analysis of Conversations*

Jonathan P. Chang, Caleb Chiam, Liye Fu, Andrew Wang, Justine Zhang and Cristian Danescu-Niculescu-Mizil

**11:30–11:50    Break**

**11:50–12:20    Knowledge Acquisition/Use and Behaviour Modeling (1)**

*Commonsense Evidence Generation and Injection in Reading Comprehension*

Ye Liu, Tao Yang, Zeyu You, Wei Fan and Philip S. Yu

*Identifying Collaborative Conversations using Latent Discourse Behaviors*

Ayush Jain, Maria Pacheco, Steven Lancette, Mahak Goindani and Dan Goldwasser

*A Case Study of User Communication Styles with Customer Service Agents versus Intelligent Virtual Agents*

Timothy Hewitt and Ian Beaver



**Wednesday, 1 July 2020 (continued)**

**12:20–12:40 Knowledge Acquisition/Use and Behaviour Modeling (1) live QA**

**12:40–15:30 *Breakout Discussion Sessions***

**15:30–16:00 *Break***

**16:00–17:00 Special Session: Greetings and Talks**

*It's About Time: Turn-Entry Timing For Situated Human-Robot Dialogue*

Felix Gervits, Ravenna Thielstrom, Antonio Roque and Matthias Scheutz

*Learning Word Groundings from Humans Facilitated by Robot Emotional Displays*

David McNeill and Casey Kennington

*Learning and Reasoning for Robot Dialog and Navigation Tasks*

Keting Lu, Shiqi Zhang, Peter Stone and Xiaoping Chen

*An Attentive Listening System with Android ERICA: Comparison of Autonomous and WOZ Interactions*

Koji Inoue, Divesh Lala, Kenta Yamamoto, Shizuka Nakamura, Katsuya Takanashi and Tatsuya Kawahara

**17:00–17:30 Demo (2) pre-recorded presentations + live QA**

*A Spoken Dialogue System for Spatial Question Answering in a Physical Blocks World*

Georgiy Platonov, Lenhart Schubert, Benjamin Kane and Aaron Gindi

*rrSDS: Towards a Robot-ready Spoken Dialogue System*

Casey Kennington, Daniele Moro, Lucas Marchand, Jake Carns and David McNeill

**Wednesday, 1 July 2020 (continued)**

**17:30–18:15 Special Session: live QA**

**18:15–19:15 Special Session: Late-breaking**

**19:15–19:30 *Break***

**19:30–20:15 *Breakouts Discussion Sessions***

**Thursday, 2 July 2020**

**5:00–5:35 Knowledge Acquisition/Use and Behaviour Modeling (2)**

*Discovering Knowledge Graph Schema from Short Natural Language Text via Dialog*

Subhasis Ghosh, Arpita Kundu, Aniket Pramanick and Indrajit Bhattacharya

*User Impressions of Questions to Acquire Lexical Knowledge*

Kazunori Komatani and Mikio Nakano

*Simulating Turn-Taking in Conversations with Delayed Transmission*

Thilo Michael and Sebastian Möller

Thursday, 2 July 2020 (continued)

**5:35–6:00**      **Knowledge Acquisition/Use and Behaviour Modeling (2) live QA**

**6:00–6:45**      **Semantic and Pragmatics Modeling**

*Is this Dialogue Coherent? Learning from Dialogue Acts and Entities*

Alessandra Cervone and Giuseppe Riccardi

*Analyzing Speaker Strategy in Referential Communication*

Brian McMahan and Matthew Stone

*Contextualized Emotion Recognition in Conversation as Sequence Tagging*

Yan Wang, Jiayu Zhang, Jun Ma, Shaojun Wang and Jing Xiao

*How Self-Attention Improves Rare Class Performance in a Question-Answering Dialogue Agent*

Adam Stiff, Qi Song and Eric Fosler-Lussier

**6:45–7:10**      **Semantic and Pragmatics Modeling live QA**

**7:10–7:30**      *Break*

**7:30–8:00**      **Modeling Convergence**

*Filtering conversations through dialogue acts labels for improving corpus-based convergence studies*

Simone Fuscone, Benoit Favre and Laurent Prévot

*Nontrivial Lexical Convergence in a Geography-Themed Game*

Amanda Bergqvist, Ramesh Manuvinakurike, Deepthi Karkada and Maike Paetzel

*A unifying framework for modeling acoustic/prosodic entrainment: definition and evaluation on two large corpora*

Ramiro H. Gálvez, Lara Gauder, Jordi Luque and Agustín Gravano

**Thursday, 2 July 2020 (continued)**

**8:00–8:20**     **Modeling Convergence live QA**

**8:20–8:45**     *Break*

**8:45–9:30**     *Sponsor Booth*

**9:30–10:15**   *Breakout Discussion Sessions*

**10:15–10:45** *Break*

**10:45–11:25** **Evaluation + Corpora (1)**

*Unsupervised Evaluation of Interactive Dialog with DialoGPT*

Shikib Mehri and Maxine Eskenazi

*Towards Unified Dialogue System Evaluation: A Comprehensive Analysis of Current Evaluation Protocols*

Sarah E. Finch and Jinho D. Choi

*Human-Human Health Coaching via Text Messages: Corpus, Annotation, and Analysis*

Itika Gupta, Barbara Di Eugenio, Brian Ziebart, Aiswarya Baiju, Bing Liu, Ben Gerber, Lisa Sharp, Nadia Nabulsi and Mary Smart

**Thursday, 2 July 2020 (continued)**

**11:25–11:50** Evaluation + Corpora (1) live QA

**11:50–12:30** *Break*

**12:30–13:00** Demo (3) pre-recorded presentations + live QA

*Agent-Based Dynamic Collaboration Support in a Smart Office Space*

Yansen Wang, R. Charles Murray, Haogang Bao and Carolyn Rose

*Emora STDM: A Versatile Framework for Innovative Dialogue System Development*

James D. Finch and Jinho D. Choi

**13:00–16:30** *Breakout Discussion Sessions*

**16:30–17:00** *Break*

17:00–17:45 *Keynote 2: Neural Text Generation: Progress and Challenges*

Asli Celikyilmaz

17:45–18:15 *Keynote 2: live QA*

Asli Celikyilmaz

**18:15–18:35** *Break*

**Thursday, 2 July 2020 (continued)**

**18:35–19:15 Generation + Task-Oriented Dialogues (2)**

*Boosting Naturalness of Language in Task-oriented Dialogues via Adversarial Training*

Chenguang Zhu

*A Sequence-to-sequence Approach for Numerical Slot-filling Dialog Systems*

Hongjie Shi

*Beyond Domain APIs: Task-oriented Conversational Modeling with Unstructured Knowledge Access*

Seokhwan Kim, Mihail Eric, Karthik Gopalakrishnan, Behnam Hedayatnia, Yang Liu and Dilek Hakkani-Tur

*Multi-Action Dialog Policy Learning with Interactive Human Teaching*

Megha Jhunjhunwala, Caleb Bryant and Pararth Shah

**19:15–19:40 Generation + Task-Oriented Dialogues (2) live QA**

**Friday, 3 July 2020**

**5:30–6:05 Evaluation + Corpora (2)**

*Is Your Goal-Oriented Dialog Model Performing Really Well? Empirical Analysis of System-wise Evaluation*

Ryuichi Takanobu, Qi Zhu, Jinchao Li, Baolin Peng, Jianfeng Gao and Minlie Huang

*Similarity Scoring for Dialogue Behaviour Comparison*

Stefan Ultes and Wolfgang Maier

*Collection and Analysis of Dialogues Provided by Two Speakers Acting as One*

Tsunehiro Arimoto, Ryuichiro Higashinaka, Kou Tanaka, Takahito Kawanishi, Hiroaki Sugiyama, Hiroshi Sawada and Hiroshi Ishiguro

**Friday, 3 July 2020 (continued)**

**6:05–6:30**      **Evaluation + Corpora (2) live QA**

**6:30–6:55**      **Dialogue Policy**

*Adaptive Dialog Policy Learning with Hindsight and User Modeling*

Yan Cao, Keting Lu, Xiaoping Chen and Shiqi Zhang

*Dialogue Policies for Learning Board Games through Multimodal Communication*

Maryam Zare, Ali Ayub, Aishan Liu, Sweekar Sudhakara, Alan Wagner and Rebecca Passonneau

**6:55–7:10**      **Dialogue Policy live QA**

**7:10–7:30**      **Break**

7:30–8:15      *Keynote 3: Argument Mining, Discourse Analysis, and Educational Applications*

Diane Litman

8:15–8:45      *Keynote 3: live QA*

Diane Litman

**8:45–9:45**      ***Business Meeting, Awards, Closing (live)***





# Keynote Abstracts

## **Keynote 1 - Conversational Turn-taking in Human-robot Interaction**

Gabriel Skantze

*KTH Royal Institute of Technologies*

### **Abstract**

The last decade has seen a breakthrough for speech interfaces, much thanks to the advancements in speech recognition. Apart from voice assistants in smart speakers and phones, an emerging application area are social robots, which are expected to serve as receptionists, teachers, companions, coworkers, etc. Just like we prefer physical meetings over phone calls and video conferencing, social robots can potentially offer a much richer interaction experience than non-embodied dialogue systems. One example of this is the Furhat robot head, which started as a research project at KTH, but is now used in commercial applications, such as serving as a concierge at airports and performing job interviews. However, even though this recent progress is very exciting, current dialogue systems are still limited in several ways, especially for human-robot interaction. In this talk, I will specifically address the modelling of conversational turn-taking. As current systems lack the sophisticated coordination mechanisms found in human-human interaction, they are often plagued by interruptions or sluggish responses. In a face-to-face conversation, we use various multi-modal signals for this coordination, including linguistic and prosodic cues, as well as gaze and gestures. I will present our work on the use of deep learning for modelling these cues, which can allow the system to predict, and even project, potential turn-shifts. I will also present user studies which show how the robot can regulate turn-taking in multi-party dialogue by employing various turn-taking signals. This can be used to both facilitate a smoother interaction, as well as shaping the turn-taking dynamics and participation equality in multi-party settings.

### **Biography**

Gabriel Skantze is professor in speech technology with a specialization in dialogue systems at KTH Royal Institute of Technology. His research focuses on the development of computational models for situated dialogue and human-robot interaction. He is also co-founder and chief scientist at Furhat Robotics, a startup based in Stockholm developing a platform for social robotics. Since 2019, he is the president of SIGdial.

## **Keynote 2 - Neural Text Generation: Progress and Challenges**

Asli Celikyilmaz

*Microsoft Research*

### **Abstract**

Automatic text generation enables computers to summarize text, describe pictures to visually impaired, write stories or articles about an event, have conversations in customer-service, chit-chat with individuals, and other settings, etc. Neural text generation – using neural network models to generate coherent text – have seen a paradigm shift in the last years, caused by the advances in deep contextual language modeling (e.g., LSTMs, GPT) and transfer learning (e.g., ELMO, BERT). While these tools have dramatically improved the state of text generation, particularly for low resource tasks, state-of-the-art neural text generation models still face many challenges: a lack of diversity in generated text, commonsense violations in depicted situations, difficulties in making use of multi-modal input, and many more. I will discuss existing technology to generate text with better discourse structure, narrative flow, or one that can use world knowledge more intelligently. I will conclude the talk with a discussion of current challenges and shortcomings of neural text generation, pointing to avenues for future research.

### **Biography**

Asli Celikyilmaz is a Principal Researcher at Microsoft Research (MSR) in Redmond, Washington. She is also an Affiliate Professor at the University of Washington. She has received Ph.D. Degree in Information Science from University of Toronto, Canada, and later continued her Postdoc study at Computer Science Department of the University of California, Berkeley. Her research interests are mainly in deep learning and natural language, specifically on language generation with long-term coherence, language understanding, language grounding with vision, and building intelligent agents for human-computer interaction. She is serving on the editorial boards of Transactions of the ACL (TACL) as area editor and Open Journal of Signal Processing (OJSP) as Associate Editor. She has received several “best of” awards including NAFIPS 2007, Semantic Computing 2009, and CVPR 2019.

### **Keynote 3 - Argument Mining, Discourse Analysis, and Educational Applications**

Diane Litman

*University of Pittsburgh*

#### **Abstract**

The written and spoken arguments of students are educational data that can be automatically mined for purposes such as student assessment or teacher professional development. This talk will illustrate some of the opportunities and challenges in educationally-oriented argument mining. I will first describe how we are using discourse analysis to improve argument mining systems that are being embedded in educational technologies for essay grading and for analyzing classroom discussions. I will then present intrinsic and extrinsic evaluation results for two of our argument mining systems, using benchmark persuasive essay corpora as well as our recently released Discussion Tracker corpus of collaborative argumentation in high school classrooms.

#### **Biography**

Diane Litman is Professor of Computer Science, Senior Scientist with the Learning Research and Development Center, and Faculty Co-Director of the Graduate Program in Intelligent Systems, all at the University of Pittsburgh. Her current research focuses on enhancing the effectiveness of educational technology through the use of spoken and natural language processing techniques such as argument mining, summarization, multi-party dialogue systems, and revision analysis. She is a Fellow of the Association for Computational Linguistics, has twice been elected Chair of the North American Chapter of the Association for Computational Linguistics, has co-authored multiple papers winning best paper awards, and was the SIGdial Program Co-Chair in 2018.

