# EMNLP 2018

Search-Oriented Conversational AI (SCAI)

Proceedings of the 2018 EMNLP Workshop SCAI: The 2nd International Workshop on Search-Oriented Conversational AI

> October 31, 2018 Brussels, Belgium



Silver Sponsor



©2018 The Association for Computational Linguistics

Order copies of this and other ACL proceedings from:

Association for Computational Linguistics (ACL) 209 N. Eighth Street Stroudsburg, PA 18360 USA Tel: +1-570-476-8006 Fax: +1-570-476-0860 acl@aclweb.org

ISBN 978-1-948087-75-9

# Introduction

Welcome to the 2nd International Workshop on Search-Oriented Conversational AI. Following the successful first edition co-located with the International Conference on the Theory of Information Retrieval (ICTIR 2017), we decided to run this workshop again, this time at an NLP conference, with the aim to bring together researchers from NLP, Machine Learning, and IR communities to instigate future direction of search-oriented conversational systems.

This year we received 22 valid submissions and decided to accept 6 papers for oral presentation and 7 papers for posters. That yields an acceptance rate of 27% for oral presentations and 59% total acceptance rate. We hope that by accepting more papers we will have more lively discussions. We are thankful to the program committee for their hard work. A separate thanks goes to the additional reviewers helping with the last-minute reviews and the PC chairs finalizing the decisions.

Aleksandr Chuklin, Jeff Dalton, Julia Kiseleva, Alexey Borisov, and Mikhail Burtsev

### **Organizers:**

Aleksandr Chuklin, Google Zürich Jeff Dalton, University of Glasgow Julia Kiseleva, University of Amsterdam Alexey Borisov, Yandex & University of Amsterdam Mikhail Burtsev, MIPT

## **Steering Committee:**

Joelle Pineau, McGill University Michel Galley, Microsoft Research Maarten de Rijke, University of Amsterdam

## **Program Committee:**

Damiano Spina, RMIT University (Australia) Igor Shalyminov, Heriot-Watt University (UK) Jaap Kamps, University of Amsterdam (The Netherlands) Tom Kenter, Google London (UK) Valentin Malykh, MIPT (Russia) Evgeny Kharitonov, Facebook Paris (France) Scott Roy, Google Mountain View (USA)

### **Additional Reviewers:**

Guillermo Garrido, Google Zürich (Switzerland) Sascha Rothe, Google Zürich (Switzerland)

### **Invited Speakers:**

Milica Gašić, University of Cambridge Mari Ostendorf, University of Washington Antoine Bordes, Facebook Research Yun-Nung (Vivian) Chen, National Taiwan University

# **Table of Contents**

Neural Response Ranking for Social Conversation: A Data-Efficient Approach      Igor Shalyminov, Ondřej Dušek and Oliver Lemon      1
Autonomous Sub-domain Modeling for Dialogue Policy with Hierarchical Deep Reinforcement Learning Giovanni Yoko Kristianto, Huiwen Zhang, Bin Tong, Makoto Iwayama and Yoshiyuki Kobayashi9
Building Dialogue Structure from Discourse Tree of a Question      Boris Galitsky and Dmitry Ilvovsky    17
A Methodology for Evaluating Interaction Strategies of Task-Oriented Conversational Agents Marco Guerini, Sara Falcone and Bernardo Magnini
A Reinforcement Learning-driven Translation Model for Search-Oriented Conversational Systems Wafa Aissa, Laure Soulier and Ludovic Denoyer
Research Challenges in Building a Voice-based Artificial Personal Shopper - Position Paper Nut Limsopatham, Oleg Rokhlenko and David Carmel
Curriculum Learning Based on Reward Sparseness for Deep Reinforcement Learning of Task Completion Dialogue Management Atsushi Saito
Data Augmentation for Neural Online Chats Response Selection    Wenchao Du and Alan Black
A Knowledge-Grounded Multimodal Search-Based Conversational Agent Shubham Agarwal, Ondřej Dušek, Ioannis Konstas and Verena Rieser
<i>Embedding Individual Table Columns for Resilient SQL Chatbots</i> Bojan Petrovski, Ignacio Aguado, Andreea Hossmann, Michael Baeriswyl and Claudiu Musat67
Exploring Named Entity Recognition As an Auxiliary Task for Slot Filling in Conversational Language Understanding Samuel Louvan and Bernardo Magnini
Why are Sequence-to-Sequence Models So Dull? Understanding the Low-Diversity Problem of Chatbots    Shaojie Jiang and Maarten de Rijke    81
Retrieve and Refine: Improved Sequence Generation Models For Dialogue    Jason Weston, Emily Dinan and Alexander Miller    87

## **Workshop Program**

### Wednesday, October 31, 2018

09:00-09:10 Introduction

### Session 1

- 09:10–09:50 Keynote 1: Antoine Bordes
- 09:50–10:10 *Neural Response Ranking for Social Conversation: A Data-Efficient Approach* Igor Shalyminov, Ondřej Dušek and Oliver Lemon
- 10:10–10:30 Autonomous Sub-domain Modeling for Dialogue Policy with Hierarchical Deep Reinforcement Learning Giovanni Yoko Kristianto, Huiwen Zhang, Bin Tong, Makoto Iwayama and Yoshiyuki Kobayashi
- 10:30-11:00 Break

#### Session 2

- 11:00–11:40 Keynote 2: Milica Gašić
- 11:40–12:00 *Building Dialogue Structure from Discourse Tree of a Question* Boris Galitsky and Dmitry Ilvovsky
- 12:00–12:20 A Methodology for Evaluating Interaction Strategies of Task-Oriented Conversational Agents Marco Guerini, Sara Falcone and Bernardo Magnini
- 12:20–12:40 A Reinforcement Learning-driven Translation Model for Search-Oriented Conversational Systems Wafa Aissa, Laure Soulier and Ludovic Denoyer
- 12:40–14:00 Lunch

### Wednesday, October 31, 2018 (continued)

### Session 3

- 14:00–14:40 Keynote 3: Yun-Nung (Vivian) Chen
- 14:40–15:00 *Research Challenges in Building a Voice-based Artificial Personal Shopper Position Paper* Nut Limsopatham, Oleg Rokhlenko and David Carmel
- 15:00–15:30 Poster session
- 15:30–16:00 Break

### Session 4

- 16:00–16:40 Keynote 4: Mari Ostendorf
- 16:40–17:20 Roundtable discussion
- 17:20–17:30 *Closing*