ACL 2018

Cognitive Aspects of Computational Language Learning and Processing

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Introduction

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The 8th Workshop on Cognitive Aspects of Computational Language Learning and Processing (CogACLL) took place on July 19, 2018 in Melbourne, Australia, in conjunction with the ACL 2018. The workshop was endorsed by ACL Special Interest Group on Natural Language Learning (SIGNLL). This is the eighth edition of related workshops first held with ACL 2007 and 2016, EACL 2009, 2012 and 2014, EMNLP 2015, and as a standalone event in 2013.

The workshop is targeted at anyone interested in the relevance of computational techniques for understanding first, second and bilingual language acquisition and change or loss in normal and pathological conditions.

The human ability to acquire and process language has long attracted interest and generated much debate due to the apparent ease with which such a complex and dynamic system is learnt and used on the face of ambiguity, noise and uncertainty. This subject raises many questions ranging from the nature vs. nurture debate of how much needs to be innate and how much needs to be learned for acquisition to be successful, to the mechanisms involved in this process (general vs specific) and their representations in the human brain. There are also developmental issues related to the different stages consistently found during acquisition (e.g. one word vs. two words) and possible organizations of this knowledge. These have been discussed in the context of first and second language acquisition and bilingualism, with cross linguistic studies shedding light on the influence of the language and the environment.

The past decades have seen a massive expansion in the application of statistical and machine learning methods to natural language processing (NLP). This work has yielded impressive results in numerous speech and language processing tasks, including e.g. speech recognition, morphological analysis, parsing, lexical acquisition, semantic interpretation, and dialogue management. The good results have generally been viewed as engineering achievements. However, researchers have also investigated the relevance of computational learning methods for research on human language acquisition and change. The use of computational modeling has been boosted by advances in machine learning techniques, and the availability of resources like corpora of child and child-directed sentences, and data from psycholinguistic tasks by normal and pathological groups. Many of the existing computational models attempt to study language tasks under cognitively plausible criteria (such as memory and processing limitations that humans face), and to explain the developmental stages observed in the acquisition and evolution of the language abilities. In doing so, computational modeling provides insight into the plausible mechanisms involved in human language processes, and inspires the development of better language models and techniques. These investigations are very important since if computational techniques can be used to improve our understanding of human language acquisition and change, these will not only benefit cognitive sciences in general but will reflect back to NLP and place us in a better position to develop useful language models.

We invited submissions on relevant topics, including:

- Computational learning theory and analysis of language learning and organization

- Computational models of first, second and bilingual language acquisition

- Computational models of language changes in clinical conditions

- Computational models and analysis of factors that influence language acquisition and use in different age groups and cultures

- Computational models of various aspects of language and their interaction effect in acquisition, processing and change

- Computational models of the evolution of language

- Data resources and tools for investigating computational models of human language processes

- Empirical and theoretical comparisons of the learning environment and its impact on language processes

- Cognitively oriented Bayesian models of language processes

- Computational methods for acquiring various linguistic information (related to e.g. speech, morphology, lexicon, syntax, semantics, and discourse) and their relevance to research on human language acquisition

- Investigations and comparisons of supervised, unsupervised and weakly-supervised methods for learning (e.g. machine learning, statistical, symbolic, biologically-inspired, active learning, various hybrid models) from a cognitive perspective.

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Workshop Program

July 19, 2018

09:00–09:10   **Welcome and Opening Session**

09:10–09:30   **Session I - Semantics**

09:10–09:30   *Predicting Brain Activation with WordNet Embeddings*
João António Rodrigues, Ruben Branco, João Silva, Chakaveh Saedi and António Branco

09:30–10:30   **Invited Talk I**

10:30–11:00   **Coffee Break**

11:00–11:50   **Session II - Production**

11:00–11:20   *Do Speakers Produce Discourse Connectives Rationally?*
Frances Yung and Vera Demberg

11:20–11:50   *Language Production Dynamics with Recurrent Neural Networks*
Jesús Calvillo and Matthew Crocker

11:50–12:30   Poster Session

11:50–12:30   *Multi-glance Reading Model for Text Understanding*
Pengcheng Zhu, Yujiu Yang, Wenqiang Gao and Yi Liu

11:50–12:30   *Predicting Japanese Word Order in Double Object Constructions*
Masayuki Asahara, Satoshi Nambu and Shin-Ichiro Sano

11:50–12:30   *Affordances in Grounded Language Learning*
Stephen McGregor and KyungTae Lim

12:30–14:00   Lunch

14:00–15:00   Invited Talk II

15:00–15:30   Session III - Processing

15:00–15:30   *Rating Distributions and Bayesian Inference: Enhancing Cognitive Models of Spatial Language Use*
Thomas Kluth and Holger Schultheis

15:30–16:00   Coffee Break

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16:00–17:00   Session IV - Syntax and Parsing

16:00–16:30   *The Role of Syntax During Pronoun Resolution: Evidence from fMRI*
Jixing Li, Murielle Fabre, Wen-Ming Luh and John Hale

16:30–17:00   *A Sound and Complete Left-Corner Parsing for Minimalist Grammars*
Miloš Stanojević and Edward Stabler

17:00–17:30   Panel, Business Meeting and Closing Session