

IWPT 2020

**The 16th International Conference  
on Parsing Technologies and  
IWPT 2020 Shared Task on  
Parsing into Enhanced Universal Dependencies**

**Proceedings of the Conference**

July 9, 2020

Organized by SIGPARSE  
the ACL Special Interest Group on Natural Language Parsing

©2020 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](mailto:acl@aclweb.org)

ISBN 978-1-952148-11-8

## Preface

Welcome to the 16th International Conference on Parsing Technologies (IWPT 2020), which this year (for the first time since 2007) is co-located with the Annual Meeting of the Association for Computational Linguistics (ACL). The IWPT meeting series, hosted by the ACL Special Interest Group in Natural Language Parsing (SIGPARSE), has been held biennially since its inaugural meeting in 1989 in Pittsburgh, PA (USA).

For 2020, the SIGPARSE steering group decided to try out something new, co-location with the main ACL meeting in the form of a reduced one-day IWPT programme. The main motivation for this move was to reduce fragmentation (and travel) and to increase IWPT visibility in the ‘mainstream’ ACL community. At the same time, IWPT launches its own series of parsing shared tasks this year, which strengthens the experimental and applied perspective on parsing technologies in the conference programme.

The IWPT 2020 shared task focuses on the parsing of Enhanced Universal Dependencies (EUD) over 17 languages. This is the first time that graph-based representations of syntactic structures are evaluated on such a large scale, and we believe it will pave way for research on richer models and representations. The task attracted system submissions from ten teams from around the world and, thus, establishes a highly relevant point of comparison for this line of syntactic analysis. We are very grateful to everyone who contributed to this shared task, starting with the data providers who worked hard to meet our deadline. Thanks to the participant teams who worked tirelessly in a short time period to provide such a set of great and interesting systems!

Owing to the COVID-19 pandemic this year, the meeting will regrettably be held entirely virtual, where for IWPT we have adopted a mostly-asynchronous format: Accepted papers (of three different types: long, short, and shared task) will be presented through pre-recorded talks, which become available online for individual viewing before the actual conference day. On the original date of the conference, July 9, there will be a three-hour live session, scheduled so that the timing should be convenient (all things considered) for participants around the world: 14:00–17:00 UTC, which translates, for example, into a starting time at 7:00 in the morning at the US West Coast and wrapping up at 1:00 in the morning in Melbourne, Australia. The live sessions will be devoted exclusively to questions and answers, organized into five thematic sessions. Authors of papers associated with each session will be available to answer questions and discuss their work (possibly also among themselves).

There has been (and to some degree still is) much uncertainty about the format of ACL and IWPT this year, and in a sense we were positively surprised to receive a number of submissions comparable to recent IWPT instances. Out of 24 regular paper submissions, the programme committee accepted 14 for presentation at the conference. The IWPT 2020 programme is complemented by one invited talk, by Paola Merlo of the University of Geneva (to whom we are immensely grateful for honoring her commitment despite the mostly-asynchronous, virtual format) and by an overview paper and ten system descriptions from the IWPT 2020 shared task. We further gratefully acknowledge the work of authors and reviewers, as well as of the ACL workshop chairs, who had to try and shepherd our community through a difficult logistics process.

Copenhagen, Davis, Groningen, Kyoto, Oslo, Paris, Peking, Prague, and Tel Aviv

Gosse Bouma, Yuji Matsumoto, Stephan Oepen, Kenji Sagae, Djamé Seddah,  
Weiwei Sun, Anders Søgaard, Reut Tsarfaty, and Dan Zeman



**Organizers:**

Kenji Sagae, University of California at Davis (General Chair)  
Anders Søgaard, University of Copenhagen (Programme Co-Chair)  
Weiwei Sun, Peking University (Programme Co-Chair)  
Gosse Bouma, University of Groningen (Shared Task Co-Chair)  
Djamé Seddah, University Paris-Sorbonne (Shared Task Co-Chair)  
Dan Zeman, Charles University in Prague (Shared Task Co-Chair)  
Stephan Oepen, University of Oslo (Publicity Chair)

**Program Committee:**

Željko Agić  
Mark Anderson  
Miguel Ballesteros  
James Barry  
Steven Bethard  
Anders Björkelund  
Gosse Bouma  
Marie Candito  
Xavier Carreras  
John Carroll  
Özlem Çetinoğlu  
Grzegorz Chrupała  
Ryan Cotterell  
Miryam de Lhoneux  
Mathieu Dehouck  
Chris Dyer  
Adam Ek  
Jennifer Foster  
Annemarie Friedrich  
Yoav Goldberg  
Carlos Gómez-Rodríguez  
Han He  
Johannes Heinecke  
James Henderson  
Daniel Hershcovich  
Jenna Kanerva  
Sandra Kübler  
Marco Kuhlmann  
Jonathan K. Kummerfeld  
Xuezhe Ma  
Gabriel Marzinotto  
Yusuke Miyao  
Mark-Jan Nederhof  
Joakim Nivre

Stephan Oepen  
Lilja Øvrelid  
Barbara Plank  
Ines Rehbein  
Roi Reichart  
Kenji Sagae  
Giorgio Satta  
Natalie Schluter  
Djamé Seddah  
Anders Søgaard  
Weiwei Sun  
Ivan Titov  
Gertjan van Noord  
Joachim Wagner  
Rui Yan  
Daniel Zeman  
Yi Zhang  
Yue Zhang

**Invited Speaker:**

Paola Merlo, University of Geneva

## Table of Contents

<i>Distilling Neural Networks for Greener and Faster Dependency Parsing</i>	
Mark Anderson and Carlos Gómez-Rodríguez . . . . .	1
<i>End-to-End Negation Resolution as Graph Parsing</i>	
Robin Kurtz, Stephan Oepen and Marco Kuhlmann . . . . .	13
<i>Integrating Graph-Based and Transition-Based Dependency Parsers in the Deep Contextualized Era</i>	
Agnieszka Falenska, Anders Björkelund and Jonas Kuhn . . . . .	24
<i>Semi-supervised Parsing with a Variational Autoencoding Parser</i>	
Xiao Zhang and Dan Goldwasser . . . . .	39
<i>Memory-bounded Neural Incremental Parsing for Psycholinguistic Prediction</i>	
Lifeng Jin and William Schuler . . . . .	47
<i>Obfuscation for Privacy-preserving Syntactic Parsing</i>	
Zhifeng Hu, Serhii Havrylov, Ivan Titov and Shay B. Cohen . . . . .	61
<i>Tensors over Semirings for Latent-Variable Weighted Logic Programs</i>	
Esma Balkir, Daniel Gildea and Shay B. Cohen . . . . .	72
<i>Advances in Using Grammars with Latent Annotations for Discontinuous Parsing</i>	
Kilian Gebhardt . . . . .	90
<i>Lexicalization of Probabilistic Linear Context-free Rewriting Systems</i>	
Richard Mörbitz and Thomas Ruprecht . . . . .	97
<i>Self-Training for Unsupervised Parsing with PRPN</i>	
Anhad Mohananey, Katharina Kann and Samuel R. Bowman . . . . .	104
<i>Span-Based LCFRS-2 Parsing</i>	
Miloš Stanojević and Mark Steedman . . . . .	110
<i>Analysis of the Penn Korean Universal Dependency Treebank (PKT-UD): Manual Revision to Build Robust Parsing Model in Korean</i>	
Tae Hwan Oh, Ji Yoon Han, Hyonsu Choe, Seokwon Park, Han He, Jinho D. Choi, Na-Rae Han, Jena D. Hwang and Hansaem Kim . . . . .	121
<i>Statistical Deep Parsing for Spanish Using Neural Networks</i>	
Luis Chiruzzo and Dina Wonsever . . . . .	131
<i>The Importance of Category Labels in Grammar Induction with Child-directed Utterances</i>	
Lifeng Jin and William Schuler . . . . .	144
<i>Overview of the IWPT 2020 Shared Task on Parsing into Enhanced Universal Dependencies</i>	
Gosse Bouma, Djamé Seddah and Daniel Zeman . . . . .	150
<i>Turku Enhanced Parser Pipeline: From Raw Text to Enhanced Graphs in the IWPT 2020 Shared Task</i>	
Jenna Kanerva, Filip Ginter and Sampo Pyysalo . . . . .	161
<i>Hybrid Enhanced Universal Dependencies Parsing</i>	
Johannes Heinecke . . . . .	173

<i>Adaptation of Multilingual Transformer Encoder for Robust Enhanced Universal Dependency Parsing</i>	
Han He and Jinho D. Choi .....	180
<i>Efficient EUD Parsing</i>	
Mathieu Dehouck, Mark Anderson and Carlos Gómez-Rodríguez .....	191
<i>Linear Neural Parsing and Hybrid Enhancement for Enhanced Universal Dependencies</i>	
Giuseppe Attardi, Daniele Sartiano and Maria Simi .....	205
<i>Enhanced Universal Dependency Parsing with Second-Order Inference and Mixture of Training Data</i>	
Xinyu Wang, Yong Jiang and Kewei Tu .....	214
<i>How Much of Enhanced UD Is Contained in UD?</i>	
Adam Ek and Jean-Philippe Bernardy .....	220
<i>The ADAPT Enhanced Dependency Parser at the IWPT 2020 Shared Task</i>	
James Barry, Joachim Wagner and Jennifer Foster .....	226
<i>KøPsala: Transition-Based Graph Parsing via Efficient Training and Effective Encoding</i>	
Daniel Hershcovich, Miryam de Lhoneux, Artur Kulmizev, Elham Pejhan and Joakim Nivre ..	235
<i>RobertNLP at the IWPT 2020 Shared Task: Surprisingly Simple Enhanced UD Parsing for English</i>	
Stefan Grünewald and Annemarie Friedrich .....	244



# Conference Program

July 9, 2020

## 14:00 UTC–14:15 UTC Session 1: Invited Talk Q&A

*Syntactic Parsing in Humans and Machines*

Paola Merlo

## 14:15 UTC–14:40 UTC Session 2: Regular Papers Q&A

*Distilling Neural Networks for Greener and Faster Dependency Parsing*

Mark Anderson and Carlos Gómez-Rodríguez

*End-to-End Negation Resolution as Graph Parsing*

Robin Kurtz, Stephan Oepen and Marco Kuhlmann

*Integrating Graph-Based and Transition-Based Dependency Parsers in the Deep Contextualized Era*

Agnieszka Falenska, Anders Björkelund and Jonas Kuhn

*Semi-supervised Parsing with a Variational Autoencoding Parser*

Xiao Zhang and Dan Goldwasser

## 14:40 UTC–15:00 UTC Session 3: Regular Papers Q&A

*Memory-bounded Neural Incremental Parsing for Psycholinguistic Prediction*

Lifeng Jin and William Schuler

*Obfuscation for Privacy-preserving Syntactic Parsing*

Zhifeng Hu, Serhii Havrylov, Ivan Titov and Shay B. Cohen

*Tensors over Semirings for Latent-Variable Weighted Logic Programs*

Esma Balkir, Daniel Gildea and Shay B. Cohen

**July 9, 2020 (continued)**

**15:10 UTC–15:35 UTC Session 4: Regular Papers Q&A**

*Advances in Using Grammars with Latent Annotations for Discontinuous Parsing*

Kilian Gebhardt

*Lexicalization of Probabilistic Linear Context-free Rewriting Systems*

Richard Mörbitz and Thomas Ruprecht

*Self-Training for Unsupervised Parsing with PRPN*

Anhad Mohananey, Katharina Kann and Samuel R. Bowman

*Span-Based LCFRS-2 Parsing*

Miloš Stanojević and Mark Steedman

**15:35 UTC–16:00 UTC Session 5: Regular Papers Q&A**

*Analysis of the Penn Korean Universal Dependency Treebank (PKT-UD): Manual Revision to Build Robust Parsing Model in Korean*

Tae Hwan Oh, Ji Yoon Han, Hyonsu Choe, Seokwon Park, Han He, Jinho D. Choi, Na-Rae Han, Jena D. Hwang and Hansaem Kim

*Statistical Deep Parsing for Spanish Using Neural Networks*

Luis Chiruzzo and Dina Wonsever

*The Importance of Category Labels in Grammar Induction with Child-directed Utterances*

Lifeng Jin and William Schuler

July 9, 2020 (continued)

**16:10 UTC–17:00 UTC Session 6: Shared Task Q&A**

*Overview of the IWPT 2020 Shared Task on Parsing into Enhanced Universal Dependencies*

Gosse Bouma, Djamé Seddah and Daniel Zeman

*Turku Enhanced Parser Pipeline: From Raw Text to Enhanced Graphs in the IWPT 2020 Shared Task*

Jenna Kanerva, Filip Ginter and Sampo Pyysalo

*Hybrid Enhanced Universal Dependencies Parsing*

Johannes Heinecke

*Adaptation of Multilingual Transformer Encoder for Robust Enhanced Universal Dependency Parsing*

Han He and Jinho D. Choi

*Efficient EUD Parsing*

Mathieu Dehouck, Mark Anderson and Carlos Gómez-Rodríguez

*Linear Neural Parsing and Hybrid Enhancement for Enhanced Universal Dependencies*

Giuseppe Attardi, Daniele Sartiano and Maria Simi

*Enhanced Universal Dependency Parsing with Second-Order Inference and Mixture of Training Data*

Xinyu Wang, Yong Jiang and Kewei Tu

*How Much of Enhanced UD Is Contained in UD?*

Adam Ek and Jean-Philippe Bernardy

*The ADAPT Enhanced Dependency Parser at the IWPT 2020 Shared Task*

James Barry, Joachim Wagner and Jennifer Foster

*KøPsala: Transition-Based Graph Parsing via Efficient Training and Effective Encoding*

Daniel Hershcovich, Miryam de Lhoneux, Artur Kulmizev, Elham Pejhan and Joakim Nivre

*RobertNLP at the IWPT 2020 Shared Task: Surprisingly Simple Enhanced UD Parsing for English*

Stefan Grünewald and Annemarie Friedrich

**July 9, 2020 (continued)**