Findings of the Association for Computational Linguistics: NAACL 2022

Findings

July 10-15, 2022
The NAACL organizers gratefully acknowledge the support from the following sponsors.

**Diamond**

![Amazon Science](image1)
![Bloomberg](image2)
![Google Research](image3)
![LivePerson](image4)

**Platinum**

![ByteDance](image5)
![Kensho](image6)
![Grammarly](image7)
![Megagon Labs](image8)

![Microsoft](image9)
![Reveal](image10)

**Gold**

![Co:here](image11)
![GResearch](image12)
![Relativity](image13)
![Servicenow](image14)
Logotype: Modernizing a classic
Primary logo
Our logo is made up of two elements: the window shape and the type. These should not be altered or recreated.
Send requests for the .eps artwork to email@tiaa.org.

Magic Data provides high quality training datasets for ML and customized AI training data labeling services to enterprises and academic institutions engaged in artificial intelligence R&D and application research to natural language processing (NLP), voice recognition (ASR), speech synthesis (TTS), and computer vision (CV).

Business@magicdatatech.com
www.magicdatatech.com
Contact Us

Silver

Bronze

D&I Champions

D&I Contributors
Organizing Committee

General Chair
Dan Roth, University of Pennsylvania and AWS AI Labs

Program Chairs
Marine Carpuat, University of Maryland
Marie-Catherine de Marneffe, Ohio State University
Ivan Vladimir Meza Ruiz, National Autonomous University of Mexico

Local Arrangements
Priscilla Rasmussen, ACL
Jennifer Rachford, ACL

Industry Track Chairs
Rashmi Gangadharaiah, Amazon
Anastassia Loukina, Grammarly
Bonan Min, Raytheon BBN Technologies

Advisors for the Industry Track
Owen Rambow, Stony Brook University
Yunyao Li, IBM Research

Tutorial Chairs
Cecilia Alm, Rochester Institute of Technology
Miguel Ballesteros, Amazon
Yulia Tsvetkov, University of Washington

Demonstration Chairs
Hannaneh Hajishirzi, University of Washington
Qiang Ning, Amazon
Avi Sil, IBM Research

Workshops Chairs
Dan Goldwasser, Purdue University
Yunyao Li, IBM Research
Ashish Sabharwal, Allen Institute for AI

Student Research Workshop Chairs
Daphne Ippolito, University of Pennsylvania
Liunian Harold Li, University of California Los Angeles  
Maria Leonor Pacheco, Purdue University

**Advisors for the Student Research Workshop**

Danqi Chen, Princeton University  
Nianwen Xue, Brandeis University

**Publication Chairs**

Ryan Cotterell, ETH Zürich  
Danilo Croce, Tor Vergata University of Rome  
Jordan Zhang.

**Ethics Chairs**

Kai-Wei Chang, University of California Los Angeles  
Diyi Yang, Georgia Institute of Technology  
Dirk Hovy, Bocconi University

**Reproducibility Chairs**

Niranjan Balasubramanian, Stony Brook University  
Jesse Dodge, Allen Institute for AI  
Annie Louis, Google  
Daniel Deutsch, University of Pennsylvania  
Yash Kumar Lal, Stony Brook University

**Sponsorship Chair**

Byron Wallace, Northeastern University

**Diversity and Inclusion Chairs**

Diana Galván, Tohoku University  
Snigdha Chaturvedi, University of North Carolina Chapel Hill  
Yonatan Bisk, Carnegie Mellon University

**Advisory for the Diversity and Inclusion Committees**

Pranav A, Dayta AI  
Luciana Benotti, National University of Córdoba

**Volunteers Chair**

Daniel Khashabi, Allen Institute for AI

**Publicity Chairs**

Nanyun (Violet) Peng, Microsoft Research  
Emily Sheng, University of North Carolina Chapel Hill
Sameer Singh, University of California Irvine

**Virtual Infrastructure Chair**

Deepak Ramachandran, Google
Martín Villalba, Saarland University
Rishita Anubhai, Amazon

**Website Chairs**

Ice Pasupat, Google
Vered Shwartz, University of British Columbia
Program Committee

Computational Social Science and Cultural Analytics
   Svitlana Volkova, Pacific Northwest National Laboratory
   David Bamman, University of California Berkeley

Dialogue and Interactive systems
   Michel Galley, Microsoft
   Kallirroi Georgila, University of Southern California
   Nina Dethlefs, University of Hull
   Heriberto Cuayáhuitl, University of Lincoln

Discourse and Pragmatics
   Viviane Moreira, Universidade Federal do Rio Grande do Sul
   Nafise Moosavi, University of Sheffield

Ethics Bias and Fairness
   Vinodkumar Prabhakaran, Google
   Svetlana Kiritchenko, National Research Council Canada

Efficient methods in NLP
   Alexandra Luccioni, Hugging Face
   Roy Schwartz, Hebrew University Hebrew University of Jerusalem

Language Generation
   Michael White, Ohio State University
   Snigdha Chaturvedi, Department of Computer Science University of North Carolina Chapel Hill
   Shashi Narayan, Google

Information Extraction
   Muhao Chen, University of Southern California
   Timothy Miller, Harvard University
   Deepak Ramachandran, Google
   Ruihong Huang, Texas A&M University

Information Retrieval and Text Mining
   Sophia Ananiadou, University of Manchester
   Luca Soldaini, Allen Institute for Artificial Intelligence
Interpretability and Analysis of Models for NLP
   Sebastian Gehrmann, Google Research
   Sameer Singh, University of California Irvine

Language Grounding to Vision Robotics and Beyond
   Parisa Kordjamshidi, Michigan State University
   Peter Anderson, Google

Language Resources and Evaluation
   Annemarie Friedrich, Bosch Center for Artificial Intelligence
   Sebastian Schuster, New York University
   Pradeep Dasigi, Allen Institute for Artificial Intelligence

Linguistic Theories Cognitive Modeling and Psycholinguistics
   Allyson Ettinger, University of Chicago
   Raquel Fernández, University of Amsterdam

Machine Learning for NLP - Classification and Structured Prediction Models
   He He, New York University
   Wei Xu, Georgia Institute of Technology

Machine Learning for NLP - Language Modeling and Sequence to Sequence Models
   Colin Raffel, Hugging Face
   Miguel Ballesteros, Amazon

Machine Translation
   Kevin Duh, Johns Hopkins University
   Gholamreza Haffari, Monash University
   Rachel Bawden, Inria

Multilinguality
   Dan Garrette, Google Research
   Avirup Sil, International Business Machines

NLP Applications
   Vukosi Marivate, University of Pretoria
   Helena Gomez Adorno, Instituto de Investigaciones en Matemáticas Aplicadas y en Sistemas - UNAM
   Wei Lu, Singapore University of Technology and Design
   Dan Goldwasser, Purdue University
Phonology Morphology and Word Segmentation
Micha Elsner, Ohio State University
Reut Tsarfaty, Bar-Ilan University Technion

Question Answering
Mihaela Bornea, IBM International Business Machines
Jordan Boyd-Graber, University of Maryland College Park
Siva Reddy, Mila McGill University

Semantics - Lexical Semantics
Adina Williams, Facebook AI Research (Meta Platforms Inc.)
Mohammad Taher Pilehvar, Tehran Institute for Advanced Studies

Semantics - Sentence-level Semantics and Textual Inference
Xiaodan Zhu, Queen’s University
Eduardo Blanco, Arizona State University
Rachel Rudinger, University of Maryland College Park

Sentiment Analysis and Stylistic Analysis
Davide Buscaldi, Ecole polytechnique
Sara Rosenthal, International Business Machines

Speech
Adam Stiff, Infoscitex Corporation
Rolando Coto Solano, Dartmouth College

Summarization
Greg Durrett, University of Texas Austin
Jackie Cheung, Microsoft

Syntax - Tagging Chunking and Parsing
Marie Candito, Université de Paris
Lilja Øvrelid, Dept. of Informatics University of Oslo

Special Theme
Jeffrey Bigham, Carnegie Mellon University

Action Editors
Zeljko Agic, Md Shad Akhtar, Malihe Alihanoi, Cecilia Alm, Mark Anderson, Jacob Andreas, Xiang Ao, Marianna Apidianaki, Yuki Arase, Mikel Artetxe, Ehsaneddin Asgari, Giuseppe Attardi, Niranjan Balasubramanian, Timothy Baldwin, Miguel Ballesteros, Mohamad Hardyman Barawi,
Garcia, Hyunsoo Cho, Jaemin Cho, Kyunghyun Cho, Sangwoo Cho, Won Ik Cho, Eunsol Choi, Jinho Choi, Jonghyun Choi, Seunghaek Choi, Shamil Chollampatt, Jaegeul Choo, Leshem Choshen, Pratulla Kumar Choubey, Jishnu Chowdhury, Md Faisal Mahbub Chowdhury, Somnath Chowdhury, Christos Christodouloupolou, Fenia Christopoulou, Alexandra Chronopoulos, Chenhui Chu, Christopher Chu, Tat-seng Chua, Jin-Woo Chung, Kenneth Church, Abu Nowshed Chy, Volkan Ciriik, Christopher Clark, Elizabeth Clark, Christopher Clarke, Miruna Clinciu, Trevor Cohen, Jeremy Cole, Marcus Collins, Pierre Colombo, Kathryn Conger, Simone Conia, Mathieu Constant, Noah Constant, Danish Contractor, Robin Cooper, Anna Corazza, Luciano Corro, Josep Crego, Danilo Croce, Fabien Cromieres, Lei Cui, Leyang Cui, Shaobo Cui, Xia Cui, Yiming Cui, Anna Currey, Tonya Custis


Michael Färber, Alexander Fabbri, Guglielmo Faggioli, Martin Fajčík, Neele Falk, Tobias Falke, Chuang Fan, Feifan Fan, Lu Fan, Anjie Fang, Wei Fang, Yihao Fang, Yuwei Fang, Hossein Fani, Amir Feder, Hao Fei, Nils Feldhus, Mariano Felice, Jiazhuan Feng, Junlan Feng, Shi Feng, Shi Feng, Shikun Feng, Xiaohong Feng, Yansong Feng, Emmanuel Fergadiotis, James Ferguson, Daniel Fernández-González, Patrick Fernandes, Elisa Ferracane, Javier Ferrando, Francis Ferraro, Thiago Ferreira, Olivier Ferret, Besnik Fetahu, Anjali Field, Alejandro Figueroa, Katja Filippova, Catherine Finegan-Dollak, Nicholas FitzGerald, Margaret Fleck, Lucie Flekova, Antske Fokkens, Marina Fomicheva, José Fonollosa, Tommaso Fornaciari, Paula Fortuna, Eric Fosler-Lussier, George Foster, Mary Ellen Foster, James Foulds, Thomas François, Anette Frank, Stella Frank, Alexander Fraser, Kathleen Fraser, Marjorie Freedman, Dayne Freitag, Markus Freitag, Andre Freitas, Lea Frermann, Daniel Fried, Guohong Fu, Jie Fu, Jinlan Fu, Peng Fu, Tsu-Jui Fu, Xingyu Fu, Xiyuan Fu, Yao Fu, Yoshinari Fujinuma, Kotaro Funakoshi, Adam Funk

Jana Götze, Carlos Gómez-Rodríguez, Matteo Gabburro, Saadia Gabriel, David Gaddy, Marco Gaido, Andrea Galassi, Mark Gales, Leilei Gan, Yujian Gan, Zhe Gan, Kuzman Ganchev, Sudip Gandhe, Ashwinkumar Ganesan, Balaji Ganesan, Debasis Ganguly, William Gaunt, Ge Gao, Jie Gao, Jun Gao, Shen Gao, Tianyu Gao, Yifan Gao, Yingbo Gao, Matt Gardner, Dinesh Garg,
Liu, Xiao Liu, Xiaodong Liu, Xien Liu, Xin Liu, Xuebo Liu, Xueqing Liu, Yang Janet Liu, Yijin Liu, Yong Liu, Yongfei Liu, Yangfei Liu, Zemin Liu, Zeming Liu, Zhenghao Liu, Zhengyuan Liu, Zhiyu Liu, Zhiyue Liu, Zhun Liu, Zihan Liu, Zoey Liu, Kyle Lo, Sharid Loaiciga, Lajanugen Logeswaran, Damien Lolive, Guodong Long, Quanyu Long, Yunfei Long, Shayne Longpre, José David Lopes, Adrian Lopez monroy, Jaime Lorenzo-Trueba, Natalia Loukachevitch, Di Lu, Kaiji Lu, Wei Lu, Xing Lu, Yichao Lu, Yu Lu, Yujie Lu, Li Lucy, Stephanie Lukin, Hongyin Luo, Huaihao Luo, Ling Luo, Ping Luo, Tianyi Luo, Kelvin Luu, Qi Lv, Shangwen Lv, Xin Lv, Qing Lyu


Ryuki Tachibana, Oyvind Tafjord, Chang-Yu Tai, Hagai Taitelbaum, Hiroya Takamuro, Shu Takei, Ece Takmaz, Derek Tam, Ronen Tamari, Fabio Tamburini, Akihiro Tamura, Chuang Tan, Fei Tan, Liling Tan, Samson Tan, Xu Tan, Kumiko Tanaka-Ishii, Hao Tang, Jiliang Tang, Liyan Tang, Raphael Tang, Shuai Tang, Siliang Tang, Yi-Kun Tang, Zhiwen Tang, Chongyao Tao, Shiva Taslimpoor, Yuka Tateishi, Marta Tatu, Hillel Taub-Tabib, Stephen Taylor, Selma Tekir, Serra Tekiroglu, Irina Temnikova, Zhiyang Teng, Ian Tenney, Maartje Ter Hoeve, Hiroki Teranishi, Harshikesh Terdalkar, Silvia Terragni, Alberto Testoni, Simone Teufel, Nithum Thain, Ashish Thapliyal, Mokanarangan Thayaparan, Stephen Thomas, Jesse Thomson, Sam Thomson, Camilo Thorne, James Thorne, Chunwei Tian, Junfeng Tian, Ran Tian, Yingtao Tian, Zhihui Tian, Jörg Tiedemann, Tiago Timpone Torrent, Evgeniia Tokarchuk, Ryoko Tokuhisa, Nadi Tomeh, Nicholas Tomlin, Sara Tonelli, Mariya Toneva, Kentaro Torisawa, Juan-Manuel Torres-Moreno, Samia Touileb, Julien Tourille, Khanh Tran, Thy Tran, Marcos Treviso, Enrica Troiano, Adam Tsakalidis, Bo-Hsiang

Emergency Reviewers

Sweta Agrawal, Hend Al-Khalifa, Tariq Alhindi, Xiang Ao, Ignacio Arroyo-Fernández, ELEFTHERIOS AVRAMIDIS

Fan Bai, Nirajan Balasubramanian, Daniel Bauer, Adrian Benton, Yonatan Bisk, Logan Born, Piyush Borole, Nadjet Bouayad-Agha, Florian Boudin, Stephanie Brandl, Chris Brew, ELEFTHERIOS BRIAKOU, Joan Byamugisha

Rémi Cardon, Khyathi Chandu, Guanhua Chen, Hanjie Chen, Hong Chen, Lei Chen, Qian Chen,
Siyuan Wang, Ye Wang, Yue Wang, Zhen Wang, Christian Wartena, Guillaume Wisniewski, Jian Wu, Qingyang Wu, Xixin Wu, Zhengxuan Wu

Weijia Xu, Wenduan Xu, Yan Xu

Yadollah Yaghoobzadeh, Jun Yang, Linyi Yang, Jin-Ge Yao, Wenlin Yao, Wenpeng Yin, Bowen Yu, Weizhe Yuan

Guanhua Zhang, Jiayao Zhang, Qiang Zhang, Xiang Zhang, Xiaoying Zhang, Yichi Zhang, Zeyu Zhang, Zhixuan Zhou, Shi Zong

**Outstanding Action Editors**

Marianna Apidianaki, Mikel Artetxe, Timothy Baldwin, Yonatan Bisk, Chloe Braud, Elena Cabrio, John Conroy, Raj Dubre, Li Dong, Zhe Gan, Kokil Jaidka, Hyeju Jang, Ekaterina Kochmar, Maria Liakata, Margot Mieskes, Maciej Ogrodniczuk, Miles Osborne, Ankur Parikh, Edoardo Ponti, Daniel Preotiuc-Pietro, Ganesh Ramakrishnan, Alla Rozovskaya, Diarmuid Séaghdha, Nathan Schneider, Emma Strubell, Sara Stymne, Trang Tran, Byron Wallace, Longyue Wang, Xin Wang, Tong Xiao, François Yvon, Michael Zock

**Outstanding Reviewers**

Table of Contents

PubHealthTab: A Public Health Table-based Dataset for Evidence-based Fact Checking
Mubashara Akhtar, Oana Cocarascu and Elena Simperl .............................................. 1

Masked Measurement Prediction: Learning to Jointly Predict Quantities and Units from Textual Context
Daniel Spokoyny, Ivan Lee, Zhao Jin and Taylor Berg-Kirkpatrick ............................. 17

PromptGen: Automatically Generate Prompts using Generative Models
Yue Zhang, Hongliang Fei, Dingcheng Li and Ping Li .................................................. 30

Improving Conversational Recommendation Systems' Quality with Context-Aware Item Meta-Information
Bowen Yang, Cong Han, Yu Li, Lei Zuo and Zhou Yu ................................................... 38

SEQZERO: Few-shot Compositional Semantic Parsing with Sequential Prompts and Zero-shot Models
Jingfeng Yang, Haoming Jiang, Qingyu Yin, Danqing Zhang, Bing Yin and Diyi Yang ........ 49

MultiVerS: Improving scientific claim verification with weak supervision and full-document context
David Wadden, Kyle Lo, Lucy Lu Wang, Arman Cohan, Iz Beltagy and Hannaneh Hajishirzi . 61

An Item Response Theory Framework for Persuasion
Anastassia Kornilova, Vladimir Eidelman and Daniel Douglass .................................... 77

Self-Supervised Contrastive Learning with Adversarial Perturbations for Defending Word Substitution-based Attacks
Zhao Meng, Yihan Dong, Mrinmaya Sachan and Roger Wattenhofer ............................. 87

Quiz Design Task: Helping Teachers Create Quizzes with Automated Question Generation
Philippe Laban, Chien-Sheng Wu, Lidiya Murakhovskaya, Wenhao Liu and Caiming Xiong . 102

In-BoXBART: Get Instructions into Biomedical Multi-Task Learning
Mihir Parmar, Swaroop Mishra, Mirali Purohit, Man Luo, Murad Mohammad and Chitta Baral 112

How to Translate Your Samples and Choose Your Shots? Analyzing Translate-train & Few-shot Cross-lingual Transfer
Iman Jundi and Gabriella Lapesa ................................................................. 129

Multi-Hop Open-Domain Question Answering over Structured and Unstructured Knowledge
Yue Feng, Zhen Han, Mingming Sun and Ping Li ......................................................... 151

FedNLP: Benchmarking Federated Learning Methods for Natural Language Processing Tasks
Bill Yuchen Lin, Chaoyang He, Zihang Ze, Hulin Wang, Yufen Hua, Christophe Dupuy, Rahul Gupta, Mahdi Soltanolkotabi, Xiang Ren and Salman Avestimehr .............................. 157

SemAttack: Natural Textual Attacks via Different Semantic Spaces
Boxin Wang, Chejian Xu, Xiangyu Liu, Yu Cheng and Bo Li .......................................... 176

Lacuna Reconstruction: Self-Supervised Pre-Training for Low-Resource Historical Document Transcription
Nikolai Vogler, Jonathan Allen, Matthew Miller and Taylor Berg-Kirkpatrick ...................... 206

FreeTransfer-X: Safe and Label-Free Cross-Lingual Transfer from Off-the-Shelf Models
Yinpeng Guo, Liangyou Li, Xin Jiang and Qin Liu ......................................................... 217

xxv
Opportunities for Human-centered Evaluation of Machine Translation Systems
Daniel J. Liebling, Katherine A Heller, Samantha Robertson and Wesley Deng ................. 229

Aligning Generative Language Models with Human Values
Ruibo Liu, Ge Zhang, Xinyu Feng and Soroush Vosoughi ........................................... 241

PerKGQA: Question Answering over Personalized Knowledge Graphs
Ritam Dutt, Kasturi Bhattacharjee, Rashmi Gangadharaiia, Dan Roth and Carolyn Rose .... 253

Zero-shot Cross-lingual Conversational Semantic Role Labeling
Han Wu, Haochen Tan, Kun Xu, Shuqi Liu, Lianwei Wu and Linqi Song ......................... 269

A Framework to Generate High-Quality Datapoints for Multiple Novel Intent Detection
Ankan Mullick, Sukannya Purkayastha, Pawan Goyal and Niloy Ganguly ....................... 282

Design Challenges for a Multi-Perspective Search Engine
Sihao Chen, Siyi Liu, Xander Uyttendaele, Yi Zhang, William Bruno and Dan Roth ......... 293

Exploring the Value of Multi-View Learning for Session-Aware Query Representation
Diego Ortiz, Jose G Moreno, Gilles Hubert, Karen Pinel-Sauvagnat and Lynda Tamine Tamine 304

Hierarchical Relation-Guided Type-Sentence Alignment for Long-Tail Relation Extraction with Distant Supervision
Yang Li, Guodong Long, Tao Shen and Jing Jiang ......................................................... 316

PCEE-BERT: Accelerating BERT Inference via Patient and Confident Early Exiting
Zhen Zhang, Wei Zhu, Jinfan Zhang, Peng Wang, Rize Jin and Tae-Sun Chung ............... 327

Learning to repair: Repairing model output errors after deployment using a dynamic memory of feedback
Niket Tandon, Aman Madaan, Peter Clark and Yiming Yang ........................................ 339

One Size Does Not Fit All: The Case for Personalised Word Complexity Models
Sian Gooding and Manuel Tragut .................................................................................. 353

TEAM: A multitask learning based Taxonomy Expansion approach for Attach and Merge
Bornali Phukon, Anasua Mitra, Ranbir Singh Sanasam and Priyankoo Sarmah ............... 366

Extracting Temporal Event Relation with Syntax-guided Graph Transformer
Shuaicheng Zhang, Qiang Ning and Lifu Huang ............................................................ 379

From Cognitive to Computational Modeling: Text-based Risky Decision-Making Guided by Fuzzy Trace Theory
Jaron Mar and Jiamou Liu ............................................................................................... 391

Few-Shot Self-Rationalization with Natural Language Prompts
Ana Marasovic, Iz Beltagy, Doug Downey and Matthew E Peters ................................. 410

DOCmT5: Document-Level Pretraining of Multilingual Language Models
Chia-Hsuan Lee, Aditya Siddhant, Viresh Ratnakar and Melvin Johnson ....................... 425

Literature-Augmented Clinical Outcome Prediction
Aakanksha Naik, Sravanthi Parasa, Sergey Feldman, Lucy Lu Wang and Tom Hope ....... 438

Improving Few-Shot Relation Classification by Prototypical Representation Learning with Definition Text
Li Zhenzhen, Yuyang Zhang, Jian-Yun Nie and Dongsheng Li ....................................... 454
Opponent Modeling in Negotiation Dialogues by Related Data Adaptation
Kushal Chawla, Gale Lucas, Jonathan May and Jonathan Gratch ................................. 661

LMTurk: Few-Shot Learners as Crowdsourcing Workers in a Language-Model-as-a-Service Framework
Mengjie Zhao, Fei Mi, Yasheng Wang, Minglei Li, Xin Jiang, Qun Liu and Hinrich Schuetze 675

Entity Cloze By Date: What LMs Know About Unseen Entities
Yasumasa Onoe, Michael JQ Zhang, Eunsol Choi and Greg Durrett ................................. 693

Data Augmentation for Low-Resource Dialogue Summarization
Yongtai Liu, Joshua Maynez, Gonçalo Simões and Shashi Narayan ................................. 703

Yang Yang Zhao, Hua Qin, Wang Zhenyu, Changxi Zhu and Shihan Wang .......................... 711

LongT5: Efficient Text-To-Text Transformer for Long Sequences
Mandy Guo, Joshua Ainslie, David Uthus, Santiago Ontanon, Jianmo Ni, Yun-Hsuan Sung and Yinfei Yang .......................................................... 724

Challenging America: Modeling language in longer time scales
Jakub Pokrywka, Filip Gralinski, Krzysztof Jassem, Karol Kaczmarek, Krzysztof Jan Jurkiewicz and Piotr Wierczon .................................................. 737

LM-CORE: Language Models with Contextually Relevant External Knowledge
Jivat Neet Kaur, Sumit Bhatia, Milan Aggarwal, Rachit Bansal and Balaji Krishnamurthy 750

A Generative Language Model for Few-shot Aspect-Based Sentiment Analysis
Ehsan Hosseini-Asl, Wenhao Liu and Caiming Xiong ..................................................... 770

Permutation Invariant Strategy Using Transformer Encoders for Table Understanding
Sarthak Dash, Sugato Bagchi, Nandana Mihindukulasooriya and Alfio Gliozzo 788

MultiNERD: A Multilingual, Multi-Genre and Fine-Grained Dataset for Named Entity Recognition (and Disambiguation)
Simone Tedeschi and Roberto Navigli .............................................................. 801

Learning to Embed Multi-Modal Contexts for Situated Conversational Agents
Haeju Lee, Oh Joon Kwon, Yunseon Choi, Minho Park, Ran Han, Yoonhyung Kim, Jinhyeon Kim, Youngjune Lee, Haebin Shin, Kangwook Lee and Kee-Eung Kim 813

Measuring and Improving Compositional Generalization in Text-to-SQL via Component Alignment
Yujian Gan, Xinyun Chen, Qiuping Huang and Matthew Purver 831

Empathetic Persuasion: Reinforcing Empathy and Persuasiveness in Dialogue Systems
Azlaan Mustafa Samad, Kshitij Mishra, Mauajama Firdaus and Asif Ekbal 844

Attention Fusion: a light yet efficient late fusion mechanism for task adaptation in NLU
Jin Cao, Chandana Satya Prakash and Wael Hamza .................................................... 857

The Limits of Word Level Differential Privacy
Justus Mattern, Benjamin Weggenmann and Florian Kerschbaum 867

Efficient Learning of Multiple NLP Tasks via Collective Weight Factorization on BERT
Christos Charalampous Papadopoulos, Yannis Panagakis, Manolis Koubarakis and Mihalis Nicolaou .......................................................... 882
Phrase-level Textual Adversarial Attack with Label Preservation
Yibin Lei, Yu Cao, Dianqi Li, Tianyi Zhou, Meng Fang and Mykola Pechenizkiy ..............1095

Prompt Augmented Generative Replay via Supervised Contrastive Learning for Lifelong Intent Detection
Vaibhav Varshney, Mayur Patidar, Rajat Kumar, Lovekesh Vig and Gautam Shroff ..............1113

OTExtSum: Extractive Text Summarisation with Optimal Transport
Peggy Tang, Kun Hu, Rui Yan, Lei Zhang, Junbin Gao and Zhiyong Wang ......................1128

Speeding Up Entmax
Maxat Tezekbayev, Vassilina Nikoulina, Matthias Gallé and Zhenisbek Assylbekov ..............1142

Improving Code-Switching Dependency Parsing with Semi-Supervised Auxiliary Tasks
Şaziye Betül Özteş, Arzuçan Özyüre, Tunga Gungor and Özlem Çetinoğlu ......................1159

Dangling-Aware Entity Alignment with Mixed High-Order Proximities
Juncheng Liu, Zequn Sun, Bryan Hooi, Yiwei Wang, Dayiheng Liu, Baosong Yang, Xiaokui Xiao and Muhaow Chen .................................................................1172

DecBERT: Enhancing the Language Understanding of BERT with Causal Attention Masks
Ziyang Luo, Yadong Xi, Jing Ma, Zhiwei Yang, Xiaoxi Mao, Changjie Fan and Rongsheng Zhang 1185

Towards Computationally Feasible Deep Active Learning
Akim Tsvigun, Artem Shelmanov, Gleb Kuzmin, Leonid Sanchkin, Daniil Larionov, Gleb Gennadijevich Gusev, Manvel Avetisian and Leonid Zhukov ..................................1198

End-to-end Spoken Conversational Question Answering: Task, Dataset and Model
Chenyu You, Nuo Chen, Fenglin Liu, Shen Ge, Xian Wu and Yuexian Zou ......................1219

Retrieval-Augmented Multilingual Keyphrase Generation with Retriever-Generator Iterative Training
Yifan Gao, Qingyu Yin, Zheng li, Rui Meng, Tong Zhao, Bing Yin, Irwin King and Michael Lyu 1233

FAtNet: Cost-Effective Approach Towards Mitigating the Linguistic Bias in Speaker Verification Systems
Divya V Sharma and Arun Balaji Buduru .................................................................1247

A Survey on Stance Detection for Mis- and Disinformation Identification
Momchil Hardalov, Arnav Arora, Preslav Nakov and Isabelle Augenstein ......................1259

Syntax Controlled Knowledge Graph-to-Text Generation with Order and Semantic Consistency
Jin Liu, Chongfeng Fan, Zhou Fengyu and Huijuan Xu ............................................1278

To Answer or Not To Answer? Improving Machine Reading Comprehension Model with Span-based Contrastive Learning
Yunjie Ji, Liangyu Chen, Chenxiao Dou, Baochang Ma and Xiangang Li .......................1292

Target-Guided Dialogue Response Generation Using Commonsense and Data Augmentation
Prakhar Gupta, Harsh Jhamtani and Jeffrey Bigham ..............................................1301

BanglaBERT: Language Model Pretraining and Benchmarks for Low-Resource Language Understanding Evaluation in Bangla
Abhik Bhattacharjee, Tahmid Hasan, Wasi Uddin Ahmad, Kazi Samin Mubashshir, Md Saiful Islam, Anindya Iqbal, M. Sohel Rahman and Rifat Shahriyar .........................1318

xxx
ALLSH: Active Learning Guided by Local Sensitivity and Hardness
Shujian Zhang, Chengyue Gong, Xingchao Liu, Pengcheng He, Weizhu Chen and Mingyuan Zhou

Low-resource Entity Set Expansion: A Comprehensive Study on User-generated Text
Yutong Shao, Nikita Bhutani, Sajjadur Rahman and Estevam Hruschka

POLITICS: Pretraining with Same-story Article Comparison for Ideology Prediction and Stance Detection
Yujian Liu, Xinliang Frederick Zhang, David Wegsman, Nicholas Beauchamp and Lu Wang

Empowering parameter-efficient transfer learning by recognizing the kernel structure in self-attention
Yifan Chen, Devamanyu Hazarika, Mahdi Namazifar, Yang Liu, Di Jin and Dilek Hakkani-Tur

RAIL-KD: RAndom Intermediate Layer Mapping for Knowledge Distillation
Md Akmal Haidar, Nithin Anchuri, Mehdi Rezagholizadeh, Abbas Ghaddar, Philippe Langlais and Pascal Poupart

Unbiased Math Word Problems Benchmark for Mitigating Solving Bias
ZhiCheng Yang, Jinghui Qin, Jiaqi Chen and Xiaodan Liang

Learn To Remember: Transformer with Recurrent Memory for Document-Level Machine Translation
Yukun Feng, Feng Li, Ziang Song, Boyuan Zheng and Philipp Koehn

Improving Few-Shot Image Classification Using Machine- and User-Generated Natural Language Descriptions
Kosuke Nishida, Kyosuke Nishida and Shuichi Nishioka

All Information is Valuable: Question Matching over Full Information Transmission Network
Le Qi, Yu Zhang, Qingyu Yin, Guidong Zheng, Wen Junjie, Jinlong Li and Ting Liu

Pathway2Text: Dataset and Method for Biomedical Pathway Description Generation
Junwei Yang, Zequn Liu, Ming Zhang and Sheng Wang

Exploring Neural Models for Query-Focused Summarization
Jesse Vig, Alexander Fabbri, Wojciech Maciej Kryscinski, Chien-Sheng Wu and Wenhai Liu

BitextEdit: Automatic Bitext Editing for Improved Low-Resource Machine Translation
Eleftheria Briakou, Sida Wang, Luke Zettlemoyer and Marjan Ghazvininejad

MixQG: Neural Question Generation with Mixed Answer Types
Lidiya Murakhovs’ka, Chien-Sheng Wu, Philippe Laban, Tong Niu, Wenhai Liu and Caiming Xiong

Temporal Attention for Language Models
Guy D. Rosin and Kira Radinsky

Efficient Few-Shot Fine-Tuning for Opinion Summarization
Arthur Brazinskas, Ramesh Nallapati, Mohit Bansal and Markus Dreyer

Domain-matched Pre-training Tasks for Dense Retrieval
Barlas Oguz, Kushal Lakhota, Anchit Gupta, Patrick Lewis, Vladimir Karpukhin, Aleksandra Piktus, Xilun Chen, Sebastian Riedel, Scott Yih, Sonal Gupta and Yashar Mehdad

xxxii
Analyzing the Intensity of Complaints on Social Media
Ming Fang, Shi Zong, Jing Li, Xinyu Dai, Shujian Huang and Jiajun Chen .......................... 1742

Detecting Narrative Elements in Informational Text
Effi Levi, Guy Mor, Tamir Sheafer and Shaul Rafael Shenhar .............................. 1755

When do Contrastive Word Alignments Improve Many-to-many Neural Machine Translation?
Zhuoyuan Mao, Chenhui Chu, Raj Dabre, Haiyue Song, Zhen Wan and Sadao Kurohashi . 1766

Minimally-Supervised Relation Induction from Pre-trained Language Model
Lu Sun, Yongliang Shen and Weiming Lu .............................................................. 1776

Crake: Causal-Enhanced Table-Filler for Question Answering over Large Scale Knowledge Base
Minhao Zhang, Ruoyu Zhang, Yanzeng Li and Lei Zou ........................................ 1787

Exploring the Universal Vulnerability of Prompt-based Learning Paradigm
Lei Xu, Yangyi Chen, Ganqu Cui, Hongcheng Gao and Zhiyuan Liu ......................... 1799

Exploiting Numerical-Contextual Knowledge to Improve Numerical Reasoning in Question Answering
Jeonghwan Kim, Junmo Kang, Kyung-min Kim, Giwon Hong and Sung-Hyun Myaeng . .1811

Learn from Relation Information: Towards Prototype Representation Rectification for Few-Shot Relation Extraction
Yang Liu, Jinpeng Hu, Xiang Wan and Tsung-Hui Chang ...................................... 1822

HUE: Pretrained Model and Dataset for Understanding Hanja Documents of Ancient Korea
Haneul Yoo, Jiho Jin, Juhee Son, JinYeong Bak, Kyunghyun Cho and Alice Oh . . . . .1832

SeaD: End-to-end Text-to-SQL Generation with Schema-aware Denoising
Kuan Xu, Yongbo Wang, Yongliang Wang, Zihao Wang, Zujie Wen and Yang Dong ...... 1845

Cross-Lingual Cross-Modal Consolidation for Effective Multilingual Video Corpus Moment Retrieval
Jiaheng Liu, Tan Yu, Hanyu Peng, Mingming Sun and Ping Li .................................. 1854

Delving Deep into Regularity: A Simple but Effective Method for Chinese Named Entity Recognition
Yingjie Gu, Xiaoye Qu, Zhefeng Wang, Yi Zheng, Baoxing Huai and Nicholas Jing Yuan . 1863

CRUSH: Contextually Regularized and User anchored Self-supervised Hate speech Detection
Souvic Chakraborty, Parag Dutta, Sumegh Roychowdhury and Animesh Mukherjee .... 1874

METGEN: A Module-Based Entailment Tree Generation Framework for Answer Explanation
Ruixin Hong, Hongming Zhang, Xintong Yu and Changshui Zhang .......................... 1887

A Timestep aware Sentence Embedding and Acme Coverage for Brief but Informative Title Generation
Quanbin Wang, XieXiong Lin and Feng Wang ....................................................... 1906

Make The Most of Prior Data: A Solution for Interactive Text Summarization with Preference Feedback
Duy-Hung Nguyen, Nguyen Viet Dung Nghiem, Bao-Sinh Nguyen, Dung Tien Tien Le, Shahab Sabahi, Minh-Tien Nguyen and Hung Le ....................................................... 1919

XLTime: A Cross-Lingual Knowledge Transfer Framework for Temporal Expression Extraction
Yuwei Cao, William Groves, Tanay Kumar Saha, Joel R. Tetreault, Alejandro Jaimes, Hao Peng and Philip S. Yu .......................................................... 1931

BehancePR: A Punctuation Restoration Dataset for Livestreaming Video Transcript
Viet Dac Lai, Amir Pouran Ben Veyseh, Franck Dernoncourt and Thien Huu Nguyen .... 1943
Event Detection for Suicide Understanding
Luis Fernando Guzman-Nateras, Viet Dac Lai, Amir Pouran Ben Veyseh, Franck Dernoncourt and Thien Huu Nguyen ................................................................. 1952

Great Power, Great Responsibility: Recommendations for Reducing Energy for Training Language Models
Joseph McDonald, Baolin Li, Nathan C. Frey, Devesh Tiwari, Vijay Gadeppally and Siddharth Samsi ................................................................. 1962

What kinds of errors do reference resolution models make and what can we learn from them?
Jorge Sánchez, Mauricio Mazuecos, Hernán Maina and Luciana Benotti .................. 1971

Uncertainty-Aware Cross-Lingual Transfer with Pseudo Partial Labels
Shuo Lei, Xuchao Zhang, Jianfeng He, Fanglan Chen and Chang-Tien Lu .................. 1987

Inigo Casanueva, Ivan Vulić, Georgios P. Spithourakis and Paweł Budzianowski ...... 1998

Challenges in Generalization in Open Domain Question Answering
Linqing Liu, Patrick Lewis, Sebastian Riedel and Pontus Stenetorp ........................ 2014

Beyond Distributional Hypothesis: Let Language Models Learn Meaning-Text Correspondence
M.j Jang, Frank Martin Mtumbuka and Thomas Lukasiewicz ............................... 2030

Por Qué Não Utiliser Alla Språk? Mixed Training with Gradient Optimization in Few-Shot Cross-Lingual Transfer
Haoran Xu and Kenton Murray ................................................................. 2043

Learning to Execute Actions or Ask Clarification Questions
Zhengxiang Shi, Yue Feng and Aldo Lipani ................................................. 2060

Capturing Conversational Interaction for Question Answering via Global History Reasoning
Jin Qian, Bowei Zou, Mengxing Dong, Xiao Li, AiTi Aw and Yu Hong ................. 2071

Learning Structural Information for Syntax-Controlled Paraphrase Generation
Erguang Yang, Chenglin Bai, Deyi Xiong, Yujie Zhang, Yao Meng, Jinan Xu and Yufeng Chen 2079

Controllable Sentence Simplification via Operation Classification
Liam Cripwell, Joël Legrand and Claire Gardent .......................................... 2091

Balancing Multi-Domain Corpora Learning for Open-Domain Response Generation
Yujie Xing, Jinglun Cai, Nils Barlaug, Peng Liu and Jon Atle Gulla ........................ 2104

Semantic-Preserving Abstractive Text Summarization with Siamese Generative Adversarial Net
Xin Sheng, Linli Xu, Yinlong Xu, Deqiang Jiang and Bo Ren ............................ 2121

Towards Job-Transition-Tag Graph for a Better Job Title Representation Learning
Jun Zhu and Celine Hudelot ................................................................. 2133

CL-ReLKT: Cross-lingual Language Knowledge Transfer for Multilingual Retrieval Question Answering
Peerat Limkonchotiwat, Wuttikorn Ponwitayarat, Can Udomcharoenchaikit, Ekapol Chuangsuwanich and Sarana Nutanong ......................... 2141

BORT: Back and Denoising Reconstruction for End-to-End Task-Oriented Dialog
Haipeng Sun, Junwei Bao, Youzheng Wu and Xiaodong He ............................ 2156

xxxiv
Multi-stage Distillation Framework for Cross-Lingual Semantic Similarity Matching
Kunbo Ding, Weijie Liu, Yuejian Fang, Zhe Zhao, Qi Ju, Xuefeng Yang, Rong Tian, Zhu Tao, Haoyan Liu, Han Guo, Xingyu Bai, Weiquan Mao, Yudong Li, Weigang Guo, Taiqiang Wu and Ningyuan Sun

On the Limitations of Dataset Balancing: The Lost Battle Against Spurious Correlations
Roy Schwartz and Gabriel Stanovsky

Specializing Pre-trained Language Models for Better Relational Reasoning via Network Pruning
Siyu Ren and Kenny Q. Zhu

D2GCLF: Document-to-Graph Classifier for Legal Document Classification
Qiqi Wang, Kaiqi Zhao, Robert Amor, Benjamin Liu and Ruofan Wang

A Label-Aware Autoregressive Framework for Cross-Domain NER
Jinpeng Hu, He Zhao, Dan Dan Guo, Xiang Wan and Tsung-Hui Chang

Jaehyung Seo, Seounghoon Lee, Chanjun Park, Yoonna Jang, Hyeonseok Moon, Sugyeong Eo, Seonmin Koo and Heuiseok Lim

Improve Discourse Dependency Parsing with Contextualized Representations
Yifei Zhou and Yansong Feng

LiST: Lite Prompted Self-training Makes Parameter-efficient Few-shot Learners
Yaqing Wang, Subhabrata Mukherjee, Xiaodong Liu, Jing Gao, Ahmed Hassan Awadallah and Jianfeng Gao

CLMLF: A Contrastive Learning and Multi-Layer Fusion Method for Multimodal Sentiment Detection
Zhen Li, Bing Xu, Conghui Zhu and Tiejun Zhao

Weakly Supervised Text Classification using Supervision Signals from a Language Model
Ziqian Zeng, Weimin Ni, Tianqing Fang, Xiang Li, Xinran Zhao and Yangqiu Song

Analytical Reasoning of Text
Wanjun Zhong, Siyuan Wang, Duyu Tang, Zenan Xu, Daya Guo, Yining Chen, Jiahai Wang, Jian Yin, Ming Zhou and Nan Duan

Denoising Neural Network for News Recommendation with Positive and Negative Implicit Feedback
Yunfan Hu, Zhaopeng Qiu and Xian Wu

Continual Machine Reading Comprehension via Uncertainty-aware Fixed Memory and Adversarial Domain Adaptation
Zhijing Wu, Hua Xu, Jingliang Fang and Kai Gao

Jointly Learning Guidance Induction and Faithful Summary Generation via Conditional Variational Autoencoders
Wang Xu and Tiejun Zhao

Context-Aware Language Modeling for Goal-Oriented Dialogue Systems
Charlie Victor Snell, Sherry Yang, Justin Fu, Yi Su and Sergey Levine

Am I Me or You? State-of-the-Art Dialogue Models Cannot Maintain an Identity
Kurt Shuster, Jack Urbanek, Arthur Szlam and Jason E Weston

Unsupervised Domain Adaptation for Question Generation with Domain Data Selection and Self-training
Peide Zhu and Claudia Hauff
Learning from Bootstrapping and Stepwise Reinforcement Reward: A Semi-Supervised Framework for Text Style Transfer
Zhengyuan Liu and Nancy F. Chen ................................................................. 2633

EA$^2$E: Improving Consistency with Event Awareness for Document-Level Argument Extraction
Qi Zeng, Qiusi Zhan and Heng Ji ................................................................. 2649

Label Refinement via Contrastive Learning for Distantly-Supervised Named Entity Recognition
Huaiyuan Ying, Shengxuan Luo, Tiantian Dang and Sheng Yu ...................... 2656

Negative Sample is Negative in Its Own Way: Tailoring Negative Sentences for Image-Text Retrieval
Zhihao Fan, Zhongyu Wei, Zejun Li, Siyuan Wang, Xuanjing Huang and Jianqing Fan ... 2667

Explore More Guidance: A Task-aware Instruction Network for Sign Language Translation Enhanced with Data Augmentation
Yong Cao, Wei Li, Xianzhi Li, Min Chen, Guangyong Chen, Long Hu, Zhengdao Li and Kai Hwang ................................................................. 2679

RoViST: Learning Robust Metrics for Visual Storytelling
Eileen Wang, Caren Han and Josiah Poon ................................................... 2691

Query2Particles: Knowledge Graph Reasoning with Particle Embeddings
Jiaxin Bai, Zihao Wang, Hongming Zhang and Yangqiu Song .................... 2703

ID10M: Idiom Identification in 10 Languages
Simone Tedeschi, Federico Martelli and Roberto Navigli .......................... 2715

Cross-Domain Classification of Moral Values
Enrico Liscio, Alin Eugen Dondera, Andrei Geadau, Catholijn M Jonker and Pradeep Kumar Murukannaiah ......................................................... 2727