

# **34th AAAI Conference on Artificial Intelligence (AAAI-20)**

## **Volume 9: EAAI Symposium and AAAI Conference Special Programs**

- EAAI Full Papers
- EAAI Poster Papers
- EAAI Model AI Assignments
- Senior Member Blue Sky Papers
- Senior Member Summary Talks
- Demonstrations
- Sister Conference

**New York, New York, USA  
7 – 12 February 2020**

ISBN: 978-1-7138-2740-5

**Printed from e-media with permission by:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571



**Some format issues inherent in the e-media version may also appear in this print version.**

Copyright© (2020) by Association for the Advancement of Artificial Intelligence  
All rights reserved.

Printed with permission by Curran Associates, Inc. (2021)

For permission requests, please contact Association for the Advancement of Artificial Intelligence  
at the address below.

Association for the Advancement of Artificial Intelligence  
2275 East Bayshore Road  
Suite 160  
Palo Alto, California 94303  
USA

Phone: 1-650-328-3123  
Fax: 1-650-321-4457

<https://aaai.org/Press/press.php>

**Additional copies of this publication are available from:**

Curran Associates, Inc.  
57 Morehouse Lane  
Red Hook, NY 12571 USA  
Phone: 845-758-0400  
Fax: 845-758-2633  
Email: [curran@proceedings.com](mailto:curran@proceedings.com)  
Web: [www.proceedings.com](http://www.proceedings.com)

# TABLE OF CONTENTS

## **EAAI SYMPOSIUM: FULL PAPERS**

SEMI-SUPERVISED LEARNING TO PERCEIVE CHILDREN'S AFFECTIVE STATES IN A TABLET TUTOR .....	13350
<i>Mansi Agarwal, Jack Mostow</i>	
GEOSPATIAL CLUSTERING FOR BALANCED AND PROXIMAL SCHOOLS .....	13358
<i>Subhodip Biswas, Fanglan Chen, Andreea Sistrunk, Sathappan Muthiah, Zhiqian Chen, Nathan Self, Chang-Tien Lu, Naren Ramakrishnan</i>	
TEACHING CONSTRAINT PROGRAMMING USING FABLE-BASED LEARNING .....	13366
<i>Mavis Chan, Cecilia Chun, Holly Fung, Jimmy H. M. Lee, Peter J. Stuckey</i>	
TEACHING UNDERGRADUATE ARTIFICIAL INTELLIGENCE CLASSES: AN EXPERIMENT WITH AN ATTENDANCE REQUIREMENT .....	13374
<i>Sven Koenig, Tansel Uras, Liron Cohen</i>	
ZHORAI: DESIGNING A CONVERSATIONAL AGENT FOR CHILDREN TO EXPLORE MACHINE LEARNING CONCEPTS .....	13381
<i>Phoebe Lin, Jessica Van Brummelen, Galit Lukin, Randi Williams, Cynthia Breazeal</i>	
MULTIPLE DATA AUGMENTATION STRATEGIES FOR IMPROVING PERFORMANCE ON AUTOMATIC SHORT ANSWER SCORING .....	13389
<i>Jiaqi Lun, Jia Zhu, Yong Tang, Min Yang</i>	
LESSONS LEARNED FROM TEACHING MACHINE LEARNING AND NATURAL LANGUAGE PROCESSING TO HIGH SCHOOL STUDENTS .....	13397
<i>Narges Norouzi, Snigdha Chaturvedi, Matthew Rutledge</i>	
TEACHING GAME AI AS AN UNDERGRADUATE COURSE IN COMPUTATIONAL MEDIA .....	13404
<i>Adam M. Smith, Daniel Shapiro</i>	
MAKING HIGH-PERFORMANCE ROBOTS SAFE AND EASY TO USE FOR AN INTRODUCTION TO COMPUTING .....	13412
<i>Joseph Spitzer, Joydeep Biswas, Arjun Guha</i>	
USING AI TECHNIQUES IN A SERIOUS GAME FOR SOCIO-MORAL REASONING DEVELOPMENT .....	13420
<i>Ange Tato, Roger Nkambou, Aude Dufresne</i>	
AN EXPERIMENTAL ETHICS APPROACH TO ROBOT ETHICS EDUCATION .....	13428
<i>Tom Williams, Qin Zhu, Daniel Grollman</i>	
AISPACE2: AN INTERACTIVE VISUALIZATION TOOL FOR LEARNING AND TEACHING ARTIFICIAL INTELLIGENCE .....	13436
<i>Chenliang Zhou, Dominic Kuang, Jingru Liu, Hanbo Yang, Zijia Zhang, Alan Mackworth, David Poole</i>	

## **EAAI SYMPOSIUM: POSTER PAPERS**

USING CLOUD TOOLS FOR LITERATE PROGRAMMING TO REDESIGN AN AI COURSE FOR NON-TRADITIONAL COLLEGE STUDENTS .....	13502
<i>Maria Hwang, Calvin Williamson</i>	
MINECRAFT AS A PLATFORM FOR PROJECT-BASED LEARNING IN AI .....	13504
<i>Sameer Singh</i>	
CODING IN THE LIBERAL ARTS THROUGH NATURAL LANGUAGE PROCESSING AND MACHINE LEARNING .....	13506
<i>Ursula Wolz, Jennifer Wilson</i>	

## **EAAI SYMPOSIUM: MODEL AI ASSIGNMENTS**

MODEL AI ASSIGNMENTS 2020 .....	13509
<i>Todd W. Neller, Stephen Keeley, Michael Guerzhoy, Wolfgang Hoenig, Jiaoyang Li, Sven Koenig, Ameet Soni, Krista Thomason, Lisa Zhang, Bibin Sebastian, Cinjon Resnick, Avital Oliver, Surya Bhupatiraju, Kumar Krishna Agrawal, James Allingham, Sejong Yoon, Jonathan Chen, Tom Larsen, Marion Neumann, Narges Norouzi, Ryan Hausen, Matthew Evett</i>	

## **SENIOR MEMBER PRESENTATION TRACK: BLUE SKY PAPERS**

BACK TO THE FUTURE FOR DIALOGUE RESEARCH .....	13514
<i>Philip R Cohen</i>	
COLLECTIVE INFORMATION .....	13520
<i>Ulle Endriss</i>	
ASSESSING ETHICAL THINKING ABOUT AI .....	13525
<i>Judy Goldsmith, Emanuelle Burton, David M. Dueber, Beth Goldstein, Shannon Sampson, Michael D. Toland</i>	
AI FOR SOFTWARE QUALITY ASSURANCE BLUE SKY IDEAS TALK .....	13529
<i>Meir Kalech, Roni Stern</i>	
AI FOR EXPLAINING DECISIONS IN MULTI-AGENT ENVIRONMENTS .....	13534
<i>Sarit Kraus, Amos Azaria, Jelena Fiosina, Maike Greve, Noam Hazon, Lutz Kolbe, Tim-Benjamin Lembcke, Jorg P. Muller, Soren Schleibaum, Mark Vollrath</i>	
OPEN-WORLD LEARNING FOR RADICALLY AUTONOMOUS AGENTS .....	13539
<i>Pat Langley</i>	
LEARNING ON THE JOB: ONLINE LIFELONG AND CONTINUAL LEARNING .....	13544
<i>Bing Liu</i>	
UNVEILING HIDDEN INTENTIONS .....	13550
<i>Gerardo Ocampo Diaz, Vincent Ng</i>	

## **SENIOR MEMBER PRESENTATION TRACK: SUMMARY TALKS**

ONLINE FAIR DIVISION: A SURVEY .....	13557
<i>Martin Aleksandrov, Toby Walsh</i>	
DEVELOPMENTS IN MULTI-AGENT FAIR ALLOCATION .....	13563
<i>Haris Aziz</i>	
LET'S LEARN THEIR LANGUAGE? A CASE FOR PLANNING WITH AUTOMATA- NETWORK LANGUAGES FROM MODEL CHECKING .....	13569
<i>Jorg Hoffmann, Holger Hermanns, Michaela Klauck, Marcel Steinmetz, Erez Karpas, Daniele Magazzeni</i>	
SOFTWARE TESTING FOR MACHINE LEARNING .....	13576
<i>Dusica Marijan, Arnaud Gotlieb</i>	
ON THE ROBUSTNESS OF FACE RECOGNITION ALGORITHMS AGAINST ATTACKS AND BIAS .....	13583
<i>Richa Singh, Akshay Agarwal, Maneet Singh, Shruti Nagpal, Mayank Vatsa</i>	
GENERALIZED ARC CONSISTENCY ALGORITHMS FOR TABLE CONSTRAINTS: A SUMMARY OF ALGORITHMIC IDEAS .....	13590
<i>Roland H. C. Yap, Wei Xia, Ruiwei Wang</i>	

## **DEMONSTRATION TRACK**

TRACEHUB - A PLATFORM TO BRIDGE THE GAP BETWEEN STATE-OF-THE-ART TIME-SERIES ANALYTICS AND DATASETS .....	13600
<i>Shubham Agarwal, Christian Muise, Mayank Agarwal, Sohini Upadhyay, Zilu Tang, Zhongshen Zeng, Yasaman Khazaeni</i>	
MAPF SCENARIO: SOFTWARE FOR EVALUATING MAPF PLANS ON REAL ROBOTS .....	13602
<i>Roman Barták, Jiri Švancara, Ivan Krasicenko</i>	
DOC2DIAL: A FRAMEWORK FOR DIALOGUE COMPOSITION GROUNDED IN DOCUMENTS .....	13604
<i>Song Feng, Kshitij Fadnis, Q. Vera Liao, Luis A. Lastras</i>	
MATCHU: AN INTERACTIVE MATCHING PLATFORM .....	13606
<i>James Ferris, Hadi Hosseini</i>	
EMBEDDING HIGH-LEVEL KNOWLEDGE INTO DQNS TO LEARN FASTER AND MORE SAFELY .....	13608
<i>Zihang Gao, Fangzhen Lin, Yi Zhou, Hao Zhang, Kaishun Wu, Haodi Zhang</i>	
CAUSAL KNOWLEDGE EXTRACTION THROUGH LARGE-SCALE TEXT MINING .....	13610
<i>Oktie Hassanzadeh, Debarun Bhattacharjya, Mark Feblowitz, Kavitha Srinivas, Michael Perrone, Shirin Sohrabi, Michael Katz</i>	
DAMN: DEFEASIBLE REASONING TOOL FOR MULTI-AGENT REASONING .....	13612
<i>Abdelraouf Hecham, Madalina Croitoru, Pierre Bisquert</i>	

D-AGREE: CROWD DISCUSSION SUPPORT SYSTEM BASED ON AUTOMATED FACILITATION AGENT .....	13614
<i>Takayuki Ito, Shota Suzuki, Naoko Yamaguchi, Tomohiro Nishida, Kentaro Hiraishi, Kai Yoshino</i>	
‘WATCH THE FLU’: A TWEET MONITORING TOOL FOR EPIDEMIC INTELLIGENCE OF INFLUENZA IN AUSTRALIA .....	13616
<i>Brian Jin, Aditya Joshi, Ross Sparks, Stephen Wan, Cécile Paris, C Raina Macintyre</i>	
DIANA'S WORLD: A SITUATED MULTIMODAL INTERACTIVE AGENT .....	13618
<i>Nikhil Krishnaswamy, Pradyumna Narayana, Rahul Bangar, Kyeongmin Rim, Dhruva Patil, David McNeely-White, Jaime Ruiz, Bruce Draper, Ross Beveridge, James Pustejovsky</i>	
GENO – OPTIMIZATION FOR CLASSICAL MACHINE LEARNING MADE FAST AND EASY .....	13620
<i>Sören Laue, Matthias Mitterreiter, Joachim Giesen</i>	
CAIRE: AN END-TO-END EMPATHETIC CHATBOT .....	13622
<i>Zhaojiang Lin, Peng Xu, Genta Indra Winata, Farhad Bin Siddique, Zihan Liu, Jamin Shin, Pascale Fung</i>	
PLAN2DANCE: PLANNING BASED CHOREOGRAPHING FROM MUSIC .....	13624
<i>Yuechang Liu, Dongbo Xie, Hankz Hankui Zhuo, Liqian Lai</i>	
DEEP POETRY: A CHINESE CLASSICAL POETRY GENERATION SYSTEM .....	13626
<i>Yusen Liu, Dayiheng Liu, Jiancheng Lv</i>	
PULSESATELLITE: A TOOL USING HUMAN-AI FEEDBACK LOOPS FOR SATELLITE IMAGE ANALYSIS IN HUMANITARIAN CONTEXTS .....	13628
<i>Tomaz Logar, Joseph Bullock, Edoardo Nemni, Lars Bromley, John A. Quinn, Miguel Luengo-Oroz</i>	
LEARNIT: ON-DEMAND RAPID CUSTOMIZATION FOR EVENT-EVENT RELATION EXTRACTION .....	13630
<i>Bonan Min, Manaj Srivastava, Haoling Qiu, Prasannakumar Muthukumar, Joshua Fasching</i>	
EXPLORATORY NAVIGATION AND SELECTIVE READING .....	13632
<i>Natwar Modani, Paridhi Maheshwari, Harsh Deshpande, Saurab Sirpurkar, Diviya ., Somak Aditya</i>	
PARTNER: HUMAN-IN-THE-LOOP ENTITY NAME UNDERSTANDING WITH DEEP LEARNING .....	13634
<i>Kun Qian, Poornima Chozhiyath Raman, Yunyao Li, Lucian Popa</i>	
COGNITIVE COMPLIANCE: ASSESSING REGULATORY RISK IN FINANCIAL ADVICE DOCUMENTS .....	13636
<i>Wanita Sherchan, Sue Ann Chen, Simon Harris, Nebula Alam, Khoi-Nguyen Tran, Christopher J. Butler</i>	
DICR: AI ASSISTED, ADAPTIVE PLATFORM FOR CONTRACT REVIEW .....	13638
<i>Dan G. Tecuci, Ravi Palla, Hamid R. Motahari Nezhad, Nishchal Ahuja, Alex Monteiro, Tigran Ishkhanov, Nigel Duffy</i>	
DATA-DRIVEN RANKING AND VISUALIZATION OF PRODUCTS BY COMPETITIVENESS .....	13640
<i>Sheema Usmani, Mariana Bernagozzi, Yufeng Huang, Michelle Morales, Amir Sabet Sarvestani, Biplav Srivastava</i>	

DRAGON-V: DETECTION AND RECOGNITION OF AIRPLANE GOALS WITH  
NAVIGATIONAL VISUALIZATION ..... 13642  
*Christabel Wayllace, Sunwoo Ha, Yuchen Han, Jiaming Hu, Shayan Monadjemi, William  
Yeoh, Alvitta Ottley*

PRESENTATIONTRAINER: ORAL PRESENTATION SUPPORT SYSTEM FOR  
IMPRESSION-RELATED FEEDBACK ..... 13644  
*Shengzhou Yi, Hiroshi Yumoto, Xueting Wang, Toshihiko Yamasaki*

AUTOMATIC CAR DAMAGE ASSESSMENT SYSTEM: READING AND  
UNDERSTANDING VIDEOS AS PROFESSIONAL INSURANCE INSPECTORS ..... 13646  
*Wei Zhang, Yuan Cheng, Xin Guo, Qingpei Guo, Jian Wang, Qing Wang, Chen Jiang, Meng  
Wang, Furong Xu, Wei Chu*

COMBINING MACHINE LEARNING MODELS USING COMBO LIBRARY ..... 13648  
*Yue Zhao, Xuejian Wang, Cheng Cheng, Xueying Ding*

### **SISTER CONFERENCE TRACK**

INTERACTIVE SCENE GENERATION VIA SCENE GRAPHS WITH ATTRIBUTES ..... 13651  
*Oron Ashual, Lior Wolf*

LEARNING HIGHER-ORDER PROGRAMS THROUGH PREDICATE INVENTION ..... 13655  
*Andrew Cropper, Rolf Morel, Stephen H. Muggleton*

RESTRAINING BOLTS FOR REINFORCEMENT LEARNING AGENTS ..... 13659  
*Giuseppe De Giacomo, Luca Iocchi, Marco Favorito, Fabio Patrizi*

ALGORITHM-IN-THE-LOOP DECISION MAKING ..... 13663  
*Ben Green, Yiling Chen*

EXPLAINING IMAGE CLASSIFIERS GENERATING EXEMPLARS AND COUNTER-  
EXEMPLARS FROM LATENT REPRESENTATIONS ..... 13665  
*Riccardo Guidotti, Anna Monreale, Stan Matwin, Dino Pedreschi*

REASONING ABOUT POLITICAL BIAS IN CONTENT MODERATION ..... 13669  
*Shan Jiang, Ronald E. Robertson, Christo Wilson*

DESIGNING EVALUATION RULES THAT ARE ROBUST TO STRATEGIC BEHAVIOR ..... 13673  
*Jon Kleinberg, Manish Raghavan*

IDENTIFIABILITY FROM A COMBINATION OF OBSERVATIONS AND EXPERIMENTS ..... 13677  
*Sanghack Lee, Juan D. Correa, Elias Bareinboim*

A COMMENTARY ON THE UNSUPERVISED LEARNING OF DISENTANGLED  
REPRESENTATIONS ..... 13681  
*Francesco Locatello, Stefan Bauer, Mario Lucic, Gunnar Rätsch, Sylvain Gelly, Bernhard  
Schölkopf, Olivier Bachem*

CONSTRAINT PROGRAMMING FOR AN EFFICIENT AND FLEXIBLE BLOCK MODELING  
SOLVER ..... 13685  
*Alex Lucia Mattenet, Ian Davidson, Siegfried Nijssen, Pierre Schaus*

THE ST. PETERSBURG PARADOX: A FRESH ALGORITHMIC PERSPECTIVE ..... 13689  
*Ardavan S. Nobandegani, Thomas R. Shultz*

ENERGY AND POLICY CONSIDERATIONS FOR MODERN DEEP LEARNING RESEARCH .....	13693
<i>Emma Strubell, Ananya Ganesh, Andrew McCallum</i>	
ABSTRACTION AND REFINEMENT IN GAMES WITH DYNAMIC WEIGHTED TERRAIN .....	13697
<i>Nathan R. Sturtevant, Devon Sigurdson, Bjorn Taylor, Tim Gibson</i>	
RESULTS ON A SUPER STRONG EXPONENTIAL TIME HYPOTHESIS .....	13700
<i>Nikhil Vyas, Ryan Williams</i>	
RANKING AND RATING RANKINGS AND RATINGS .....	13704
<i>Jingyan Wang, Nihar B. Shah</i>	

**Author Index**