2022 Fourth International Conference on Transdisciplinary AI (TransAI 2022)

Laguna Hills, California, USA **19 – 21 September 2022**



IEEE Catalog Number: CFP22S76-POD **ISBN:**

978-1-6654-7185-5

Copyright © 2022 by the Institute of Electrical and Electronics Engineers, Inc. All Rights Reserved

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

| IEEE Catalog Number: | CFP22S76-POD |
|-------------------------|-------------------|
| ISBN (Print-On-Demand): | 978-1-6654-7185-5 |
| ISBN (Online): | 978-1-6654-7184-8 |

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 E-mail: curran@proceedings.com Web: www.proceedings.com



2022 Fourth International Conference on Transdisciplinary AI (TransAI) **TransAI 2022**

Table of Contents

| Message from the TransAI 2022 General Co-Chairs | ix |
|---|----|
| Message from the TransAI 2022 Program Co-Chairs | x |

E-Health and Planet Health

| Towards a Taxonomy of AI Risks in the Health Domain |
|---|
| Measuring Reproduciblity of Machine Learning Methods for Medical Diagnosis |
| Data-Driven Assessment of Dementia Caregivers' Burden: One Size Does not Fit All |
| Enhanced Plastic Recycling Using RGB+Depth Fusion with MassFaster and MassMask R-CNN 22 Dillam Jossue Diaz Romero (KU Leuven, Belgium), Isiah Zaplana (Core Lab VCCM, Flanders Make, Belgium), Simon Van den Eynde (Core Lab VCCM, Flanders Make, Belgium), Wouter Sterkens (KU Leuven, Belgium), Toon Goedemé (KU Leuven, Belgium), and Jef Peeters (Core Lab VCCM, Flanders Make, Belgium) |
| Effectiveness of Deep Learning for Erasing Satellite Streaks in Astronomical Photos |

NLP, Neural Networks and Markov Chains

| Generating Natural Language Explanations for Black-Box Predictions | 40 |
|--|----|
| Neural Network Modeling of HIV Acute and Chronic Phases With and Without Antiretroviral Intervention | 47 |
| Learning Programming in Social Media : An NLP-Powered Reddit Study Yang Liu (North Carolina A&T State University, USA) and Mohd Anwar (North Carolina A&T State University, USA) | 55 |
| Leveraging Differences in Entropy for Password Generating Models | 59 |

Machine Learning, Deep Learning and Automated Assessment Tools

| Extensions to Generalized Annotated Logic and an Equivalent Neural Architecture | 3 |
|---|---|
| Inclusion and Exclusion Criteria for Automating Adherence to Scope of Conference Calls for Papers 7 Adam Craig (Brain Health Alliance, Ladera Ranch, Hong Kong Baptist 7 University, Hong Kong) and Carl Taswell (Brain Health Alliance, Ladera Ranch, UC San Diego, San Diego) | 1 |
| A Language Model Identifies Population-Level Features of the T Cell Receptor via Self-Supervised Learning | 5 |
| Multimodal Recommender System in the Prediction of Disease Comorbidity | • |
| A Language Processing-Free Unified Spam Detection Framework Using Byte Histograms and Deep Learning | 3 |
| Twitter Bot Detection Using Social Network Analysis 87 Thi Bui (San Jose State University, USA) and Katerina Potika (San Jose 87 State University, USA) 87 | 7 |

Machine Learning and Deep Learning

Rapid Betweenness Centrality Estimates for Transportation Networks Using Capsule Networks 89 *Abdul Matin (Colorado State University, USA), Samuel Armstrong (Colorado State University, USA), Saptashwa Mitra (Colorado State University, USA), Shrideep Pallickara (Colorado State University, USA), and Sangmi Lee Pallickara (Colorado State University, USA)*

| Tuning Small Datasets for a Custom Apple Sorting System Based on Deep Learning |
|--|
| Characterizing Coding Style of Phishing Websites Using Machine Learning Techniques |
| Learning to Evolve Procedural Content in Games Using Cultural Algorithms |
| Establishing Transparency in Artificial Intelligence Systems |

TEML Workshop

Contextualizing Lung Nodule Malignancy Predictions with Easy vs. Hard Image Classification..... 122 Edward Xu (DePaul University, USA), Thiruvarangan Ramaraj (DePaul University, USA), Roselyne Tchoua (DePaul University, USA), Jacob Furst (DePaul University, USA), and Daniela Raicu (DePaul University, USA)

Making Machine Learning Datasets and Models FAIR for HPC: A Methodology and Case Study ... 128 Pei-Hung Lin (Lawrence Livermore National Laboratory, USA), Chunhua Liao (Lawrence Livermore National Laboratory, USA), Winson Chen (Lawrence Livermore National Laboratory, USA; University of California Santa Cruz, USA), Tristan Vanderbruggen (Lawrence Livermore National Laboratory, USA), Murali Emani (Argonne National Laboratory, USA), and Hailu Xu (California State University, USA)

ai4cp Workshop

| Classifying Imbalanced Data with AUM Loss Joseph R. Barr (MI Lab, Acronis SCS, USA), Toby D. Hocking (Northern Arizona University, USA), Garinn Morton (MI Lab, Acronis SCS, USA), Tyler Thatcher (Mi Lab, Acronis SCS, USA), and Peter Shaw (Oujiang laboratory, China) | 135 |
|--|-----|
| Graph Embedding A Methodological Survey Joseph R. Barr (MI Lab, Acronis SCS, USA), Peter Shaw (Oujiang laboratory, China), Faisal. N Abu-Khzam (Lebanese American University, Lebanon), Tyler Thatcher (MI Lab, Acronis SCS, USA), and Toby Dylan Hocking (Northern Arizona University, USA) | 142 |
| Interpretable Linear Models for Predicting Security Vulnerabilities in Source Code Toby D. Hocking (Northern Arizona University), Joseph R. Barr (Acronis SCS, Scottsdale, USA), and Tyler Thatcher (Acronis SCS, Scottsdale, USA) | 149 |

| Cyber Threat Intelligence and Machine Learning | |
|--|--|
| Jon C. Haass (Embry-Riddle Aeronautical University, USA) | |

| Author Index | |
|--------------|--|
|--------------|--|