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Anomaly and Novelty Detection, Explanation, and Accommodation (ANDEA)

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ABSTRACT

The detection of, explanation of, and accommodation to anomalies and novelties are active research areas in multiple communities, including data mining, machine learning, and computer vision. They are applied in various guises including anomaly detection, out-of-distribution example detection, adversarial example recognition and detection, curiosity-driven reinforcement learning, and open-set recognition and adaptation, all of which are of great interest to the SIGKDD community. The techniques developed have been applied in a wide range of domains including fraud detection and anti-money laundering in fintech, early disease detection, intrusion detection in large-scale computer networks and data centers, defending AI systems from adversarial attacks, and in improving the practicality of agents through overcoming the closed-world assumption.

This workshop is focused on Anomaly and Novelty Detection, Explanation, and Accommodation (ANDEA). It will gather researchers and practitioners from data mining, machine learning, and computer vision communities and diverse knowledge background to promote the development of fundamental theories, effective algorithms, and novel applications of anomaly and novelty detection, characterization, and adaptation. All materials of keynote talks, panel discussion, and accepted papers of the workshop are made available at https://tinyurl.com/andea2021.

CCS CONCEPTS

• **Computing methodologies** → **Machine learning**; **Artificial intelligence**; **Anomaly detection**; • **Security and privacy** → **Intrusion/anomaly detection and malware mitigation**.

KEYWORDS

anomaly detection, outlier detection, novelty detection, anomaly explanation, novelty explanation, novelty accommodation

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graph representation learning are among the most cited articles in ACM CSUR, WSDM, SDM, and CIKM within the past five years according to Google Scholar Metrics. His was selected for the AAAI 2021 New Faculty Highlights program. He regularly serves on (senior) program committees for major international conferences and reviews for reputable journals. He was the Sponsor Chair for WSDM 2020.

Name: Anton van den Hengel
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Bio-sketch: Dr. Anton van den Hengel is the founding Director of The Australian Institute for Machine Learning, Australia's largest machine learning research group. He is also a Chief Investigator of the Australian Centre of Excellence in Robotic Vision, and a Professor of Computer Science at the University of Adelaide. He has been a CI on over $60m in research funding from sources including Google, Facebook, Canon, BHP Billiton and the ARC. Dr. van den Hengel has won a number of awards, including the Pearcey Foundation Entrepreneur Award, the SA Science Excellence Award for Research Collaboration, and the CVPR Best Paper prize in 2010. He has authored over 300 publications, has an h-index of 57, has had 8 patents commercialised, formed 2 start-ups, and has recently had a medical technology achieve first-in-class FDA approval. Current research interests include deep learning, vision and language problems, interactive image-based modelling, large-scale video surveillance, and medical machine learning. Dr. van den Hengel and his team have developed world leading methods in a range of areas within Computer Vision and Machine learning, including methods which have placed first on a variety of international leaderboards such as: PASCAL VOC (2015 & 2016), CityScapes (2016 & 2017), Virginia Tech VQA (2016 & 2017), and the Microsoft COCO Captioning Challenge (2016). His team placed 4th in the ImageNet detection challenge in 2015 ahead of Google, Intel, Oxford, CMU and Baidu, and 2nd in ImageNet Scene Parsing in 2016. ImageNet is one of the most hotly contested challenges in Computer Vision.

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He is the Chair of ACM SIGKDD Australia and New Zealand Chapter, IEEE Task Force on Data Science and Advanced Analytics, and IEEE Task Force on Behavioral, Economic and Sociocultural Computing. He serves as conference co-chair of KDD2015, PAKDD13 and ADMA13, and program co-chair or vice-chair of PAKDD17, PAKDD11, ICDM10 etc. After resigning from a Chief Technology Officer and joining UTS as a full-time academia, he has led teams working in more than 10 domains with many federal, state, private and international partner organizations, including Microsoft, SAS, Teradata, Australian Taxation Office, Department of Human Services, Department of Financial Services, Insurance Australian Group, and Westpac. He and his team's work on big data analytics has led to estimated billions of dollars savings per annum for the relevant organizations. His research interests include data science and mining, machine learning, behavior informatics and agent mining. His leadership in data science has been recognized by the 2019 Eureka Prize for Excellence in Data Science.

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Bio-sketch: Dr. Thomas Dietterich (AB Oberlin College 1977; MS University of Illinois 1979; PhD Stanford University 1984) is Distinguished Professor and Director of Intelligent Systems in the School of Electrical Engineering and Computer Science at Oregon State University, where he joined the faculty in 1985. In 1987, he was named a Presidential Young Investigator for the NSF. In 1990, he published, with Dr. Jude Shavlik, the book entitled Readings in Machine Learning, and he also served as the Technical Program Co-Chair of the National Conference on Artificial Intelligence (AAAI-90). From 1992-1998 he held the position of Executive Editor of the journal Machine Learning. The Association for the Advancement of Artificial Intelligence named him a Fellow in 1994, and the Association for Computing Machinery did the same in 2003. In 2000, he co-founded a free electronic journal: The Journal of Machine Learning Research, and he is currently a member of the Editorial Board. Since 2007, he has served as arXiv moderator for Machine Learning. He was Technical Program Chair of the Neural Information Processing Systems (NIPS) conference in 2000 and General Chair in 2001. He is Past-President of the International Machine Learning Society, a member of the IMLS Board, and he also serves on the Advisory Board of the NIPS Foundation. He was President of the Association for the Advancement of Artificial Intelligence in 2014-2016.