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Edition DOI: 10.1145/3557785

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Welcome to AI Matters 8(2)

Anuj Karpatne, co-editor (Virginia Tech; aimatters@sigai.acm.org)
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DOI: 10.1145/3557785.3557786

Issue overview

Welcome to the second issue of this year’s AI Matters Newsletter. We open with a conference report by Louise Dennis, followed by a summary of events happening during 2022-2023 by Dilini Samarasinghe. This third article is a collection of responses to blue sky questions about AI education from the AAAI/ACM SIGAI New and Future AI Educator Program. Finally, the last issue by Register et al. discusses the pillars of joy and justice for AI, Machine Learning, and Data Science education.

Submit to AI Matters!

Thanks for reading! Don’t forget to send your ideas and future submissions to AI Matters! We’re accepting articles and announcements now for the next issue. Details on the submission process are available at http://sigai.acm.org/aimatters.

Anuj Karpatne is co-editor of AI Matters. He is an Assistant Professor in the Department of Computer Science at Virginia Polytechnic Institute and State University (Virginia Tech). He leads the Physics-Guided Machine Learning (PGML) Lab at Virginia Tech, where he develops novel ways of integrating scientific knowledge (or physics) with machine learning methods to accelerate scientific discovery from data.

Ziyu Yao is co-editor of AI Matters. She is an Assistant Professor in the Department of Computer Science at George Mason University. Her research interests lie in natural language processing (NLP) and artificial intelligence (AI), particularly building natural language interfaces that can reliably assist humans in knowledge acquisition and task completion. She also works in NLP/AI for other disciplines such as Software Engineering and Bioinformatics.

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This section is compiled from reports of recent events sponsored or run in cooperation with ACM SIGAI. In general these reports were written and submitted by the conference organisers.

12th International Joint Conference on Computational Intelligence (IJCCI 2020)

Online 11/02/2020 - 11/04/2020
https://ijcci.scitevents.org/?y=2020

IJCCI 2020 was exceptionally held as an online streaming event, due to covid-19, from November 2-4, 2020. It was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC).

IJCCI 2020 was organized in cooperation with the ACM SIGAI - ACM Special Interest Group on Artificial Intelligence, the International Neural Network Society (INNS), the World Federation on Soft Computing, the European Society for Fuzzy Logic and Technology, the Associazione Italiana per l'Intelligenza Artificiale, the Spanish Association of Artificial Intelligence (AEPiA), and the Portuguese Association for Artificial Intelligence. It was also technically co-sponsored by the International Federation of Automatic Control (IFAC) and the IEEE Systems, Man and Cybernetics Society - TC of Computational Intelligence.

IJCCI received 65 paper submissions from 29 countries. To evaluate each submission, a double blind paper review was performed by the Program Committee. After a stringent selection process, 29.23% of the papers were published and presented as full papers, i.e. completed work (12 pages/25’ oral presentation).

Four invited talks were delivered by internationally distinguished speakers, namely:

• Erdal Kayacan, Aarhus University, Denmark
• Sanaz Mostaghim, Otto-von-Guericke-Universität Magdeburg, Germany
• Kalyanmoy Deb, Michigan State University, United States
• M. Verleysen, Machine Learning Group, Université Catholique de Louvain, Belgium

Additionally, the conference acknowledged "Best Paper Awards" and "Best Student Paper Awards", which were all conferred during the conference. More information can be found at: https://ijcci.scitevents.org/PreviousAwards.aspx

International Conference on Robotics, Computer Vision and Intelligent Systems (Robovis 2020)

Online 11/04/2020-11/06/2020
https://robovis.scitevents.org/?y=2020

ROBOVIS 2020 was exceptionally held as an online streaming event, due to covid-19, from November 4-6, 2020. It was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC). ROBOVIS 2020 was organized in cooperation with the ACM SIGAI - ACM Special Interest Group on Artificial Intelligence. ROBOVIS received 20 paper submissions from 14 countries. To evaluate each submission, a double blind paper review was performed by the Program Committee. After a stringent selection process, 20% of the papers were published and presented as full papers, i.e. completed work (12 pages/25’ oral presentation).

Four invited talks were delivered by internationally distinguished speakers, namely:

• Krzysztof Kozlowski, Poznan University of Technology, Poland
• Sanaz Mostaghim, Otto-von-Guericke-Universität Magdeburg, Germany
• Csaba Benedek, SZTAKI, Institute for Computer Science and Control, Hungary
• Erdal Kayacan, Aarhus University, Denmark

Additionally, a "Best Paper Award" was conferred at the conference venue. More information can be found at: https://robovis.scitevents.org/PreviousAwards.aspx
Foundations of Digital Games (FDG ’21)

Online 08/02/2021-08/06/2021
http://fdg2021.org/

The FDG 2021 conference was held online. Although this was a very difficult decision to make, due to the COVID-19 pandemic, it was the right choice to make. It was held over five (5) days. FDG is an interdisciplinary conference on technology used to develop digital games and the study of digital games and their design, where academics can present their work to a diverse audience, share new ideas, and find collaborations with different backgrounds. The target audience primarily consists of games researchers and game AI researchers. The theme for FDG2021 was Diversity & Inclusion through Games.

We received a total of 100 research paper submissions in six different research tracks. Of these, we accepted 38 (acceptance rate: 38%). In addition, we accepted nine late-breaking paper submissions. We introduced a new track this year – Reflections. We received four submissions and accepted two. FDG’21 also hosts four workshops, three of which have papers published in these proceedings. Some workshops have a long history within FDG, such as the 12th workshop on Procedural Content Generation. FDG’21 also includes four keynotes, one competition, six demos, and one presentation at the Doctoral Consortium.

Four keynotes framed the conference. These were:

• Katja Hofmann – Developing agents capable of learning complex human-like behaviors Rilla
• Khaled - Playful Design
• Regan Mandryk - The benefits of social gaming
• Mark Billinghurst – How empathic Computing can be used to create new types of games and shared digital experiences.

The best papers were

• Web-based Programming for Low-cost Gaming Handhelds. Michal Moskal, Thomas Ball, Abhijith Chatra, James Devine, Peli de Halleux, Steve Hodges, Shannon Kao, Richard Knoll, Galen Nickel, Jacqueline Russell, Joey Wunderlich and Daryl Zuniga
• Improving the Discoverability of Indie Games by Leveraging their Similarity to Top-Selling Games. Ngoc Quang Vu and Cor-Paul Bezemer
• Dealing with Adversarial Player Strategies in the Neural Network Game iNNk through Ensemble Learning. Mathias Löwe, Jennifer Villareale, Evan Freed, Aleksanteri Sladek, Jichen Zhu and Sebastian Risi
• There Is No Escape: Theatricality in Hades. Nick Junius, Max Kreminski and Michael Mateas
• Increasing player engagement, retention and performance through the inclusion of educational content in a citizen science game. Rogerio de Leon Pereira, Anthony Tan, Andrea Bunt and Olivier Tremblay-Savard
• A Grounded Theory of Accessible Game Development. Jozef Kulik, Jen Beeston and Paul Cairns

The First International Conference on AI-ML Systems

Hybrid Bangalore, India 10/21/2021-10/24/2021
https://www.aimlsystems.org

AIMLSystems is a new conference that targets the research in the intersection of Systems Engineering and Artificial Intelligence and Machine Learning techniques. Through this conference, we plan to examine how immense strides in AI/ML techniques are made possible through advances in the computational systems and how the use of AI/ML can help in the data-driven explorations of the design space of the computational systems. We also investigate how new breeds of AI/ML systems enable new forms of socio-techno-economic systems and they in turn generate new requirements for research in AI/ML techniques. This conference series is an initiative of the COMSNETS Association, a not-for-profit organization, which has organized the prestigious COMSNETS conference every year since 2009. ACM has awarded it the in- cooperation status and several top-notch institutions are its patrons.

AIMLSystems 2021 had ten outstanding
Keynote speakers from across the globe. The high quality conference was held in cooperation with ACM, ACM SIGAI, ACM SIGMOD, ACM SIGKDD. The patrons of the first edition of the conference were MINRO, Amazon, TCS Research and ZenTree Labs. The conference included a Research Track, an Industry Track, Demos and a Doctoral Symposium.

The areas of interest were broadly categorized into the following three streams: (1) Systems for AI/ML, including but not limited to CPU/GPU architectures for AI/ML; Embedded hardware for AI/ML workloads; Data intensive systems for efficient and distributed training; Challenges in production deployment of ML systems; Efficient model training, optimization and inference; Hardware efficient ML methods; Resource-constrained ML. (2) AI/ML for Systems, including but not limited to AI/ML for VLSI and architecture design; AI/ML in compiler optimization; AI/ML in data management - including database optimizations, virtualization, etc.; AI/ML for networks - design of networks, load modeling, etc.; AI/ML for power management - green computing, power models, etc. (3) Applications of AI/ML in Socio-Economic Systems Design, which includes, but not limited to: Computational design and analysis of socio-economic systems; Fair and bias-free systems for social welfare, business platforms; Applications of AI/ML in the design, short-/long-term analysis of cyber-physical systems; Mechanism design for socio-economic systems; Applications of AI/ML in financial systems.

Keynote Speakers:

- Sang Cha, SNU, Korea. Data Science for Everyone
- Juliana Freire, NYU Tandon School of Engineering, USA. Towards Usability and Trust for Data-Driven Models
- Johannes Gehrke, Microsoft Research, Redmond, USA. ML in Microsoft Teams and The Future of Software
- Sergei Kuznetsov, HSE University, Moscow, Russia. Learning Rules and Taxonomies for Better Explanation
- Geoff Webb, Monash University, Australia. Time series classification at scale
- Gerhard Weikum, Max-Planck-Institut für Informatik, Germany. Knowledge Graphs 2021: Achievements, Challenges and Opportunities
- Anand Deshpande, Persistent Systems, India. Deploying Machine Learning to help make Better Decisions
- Daniel Keller, Visable Labs GmbH, Germany. Value creation in Classifieds, E-Commerce and Marketplace business with AI / ML and its challenges.
- Rajeev Rastogi, Amazon, India. Machine Learning Modeling Best Practices
- Ananth Krishnan, TCS, India. Scaling AI, Responsibly

Award winning papers and their authors:

- Outstanding Application Oriented Research paper. Resource Constrained Neural Networks for Direction-of-Arrival Estimation in Microcontrollers. Piyush Ranjan Sahoo

Proceedings are published in the ACM Digital Library.

IEEE International Conference on Artificial Intelligence and Virtual Reality 2021 (IEEE AIVR 2021)

Online 11/15/2021-11/17/2021
https://aivr.science.uu.nl/index.html

Like pretty much all conferences scheduled after March 2020, IEEE AIVR 2021 had to be held virtually due to the COVID-19-enforced restrictions. The conference has a three full-day schedule (from November 15 to November 17) with online presentations using video conferencing (Google Meet) and interactive poster and demo sessions using the web-based Gather Town environment. Despite the special circumstances due to the pandemic, IEEE AIVR 2021 saw a steady growth in submissions compared to previous years. It is particularly pleasing to see that now in its fourth incarnation, IEEE AIVR seems to develop a unique community attracting people from different areas.

IEEE AIVR provides an international forum for the researchers and industries from all areas
of AI as well as Virtual, Augmented, and Mixed Reality to exchange ideas and together define the future of exciting research domains. While the majority of submissions is coming from VR/AR-related domains, the relevance that AI does or potentially can play in these works was clearly visible. The event was complemented by four workshops that also addressed interesting and relevant topics at the intersection between AI and VR/AR: One on AI in Music and Live Concerts, one on Artificial Intelligence and Ethics in XR, one on Modeling and Animating Realistic Crowds and Humans, and one on XR Technologies in Museums. This year we also cooperated with MediaTek to organize a Grand Challenge session related to “Visual Attention Estimation in HMD.” We hope to establish a stronger industry connection again for 2022.

The 14th International Conference on Agents and Artificial Intelligence (ICAART)

Online 03/02/2022-05/02/2022
https://icaart.scitevents.org/?y=2022

ICAART 2022 was held as an online event from 3-5 February, 2022. It was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC).

ICAART 2022 was also technically co-sponsored by IEEE Computational Intelligence Society, as well as organized in cooperation with the ACM SIGAI - ACM Special Interest Group on Artificial Intelligence, the Spanish Association for Artificial Intelligence, Associazione Italiana per l’Intelligenza Artificiale, Association for the Advancement of Artificial Intelligence, IberoAmerican Society for Artificial Intelligence, Associação Portuguesa de Reconhecimento de Padrões, Portuguese Association for Artificial Intelligence.

ICAART received 302 paper submissions from 53 countries. To evaluate each submission, a double-blind paper review was performed by the Program Committee. After a stringent selection process, 26.82% of the papers were published and presented as full papers, i.e. completed work (12 pages/25’ oral presentation).

Three invited talks were delivered by internationally distinguished speakers, namely:

- Michael Beetz, University of Bremen, Germany
- Jan Seyler, Festo SE & Co. KG, Germany
- Catherine Pelachaud, CNRS/University of Pierre and Marie Curie, France

Additionally, a “Best Paper Award”, a “Best Student Paper Award”, two “Best Poster Awards”, and a “Best Industrial Paper Award” were conferred during the conference. More information can be found at: https://icaart.scitevents.org/PreviousAwards.aspx

The 11th International Conference on on Pattern Recognition Applications and Methods (ICPRAM)

Online 03/02/2022-05/02/2022
https://icpram.scitevents.org/?y=2022

ICPRAM 2022 was held via Online Streaming, from February 3 to 5, 2022. It was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC).

ICPRAM 2022 was also technically co-sponsored by IEEE Computational Intelligence Society, as well as organized in cooperation with the ACM SIGAI - ACM Special Interest Group on Artificial Intelligence, the Association for the Advancement of Artificial Intelligence, the International Neural Network Society, the Associação Portuguesa de Reconhecimento de Padrões, the European Association for Biometrics, the Associazione Italiana per l’Intelligenza Artificiale. Finally, it was endorsed by the International Association for Pattern Recognition.

ICPRAM received 107 paper submissions from 33 countries. To evaluate each submission, a double blind paper review was performed by the Program Committee. After a stringent selection process, 24.3% of the papers were published and presented as full papers, i.e. completed work (12 pages/25’ oral presentation).

Four invited talks were delivered by internationally distinguished speakers, namely:

- Mihaela van der Schaar, University of Cambridge, United Kingdom
• Krystian Mikolajczyk, Imperial College London, United Kingdom
• Tinne Tuytelaars, KU Leuven, Belgium
• Nicu Sebe, University of Trento, Italy

Additionally, a "Best Paper Award", a "Best Student Paper Award", “Best Industrial Paper” and two “Best Poster Awards” were conferred at the conference venue. More information can be found at: https://icpram.scitevents.org/PreviousAwards.aspx

15th International Joint Conference on Biomedical Engineering Systems and Technologies (BIOSTEC)

Online 02/09/2022-02/11/2022
https://biostec.scitevents.org/?y=2022

BIOSTEC 2022 was exceptionally held as an online streaming event, due to covid-19, from February 9-11, 2022. It was sponsored by the Institute for Systems and Technologies of Information, Control and Communication (INSTICC). BISTEC 2022 was organized in cooperation with the ACM SIGAI - ACM Special Interest Group on Artificial Intelligence, the ACM SIGBio - ACM Special Interest Group on Bioinformatics, Computational Biology, and Biomedical Informatics, the Association for the Advancement of Artificial Intelligence, the International Society for Computational Biology (ISCB), the European Alliance for Medical and Biological Engineering and Science (EAMBES), the Société Francaise de Genie Biologique et Medical (SFGBM), the Swiss Society for Biomedical Engineering and the German Society for Biomedical Engineering.

BIOSTEC received 262 paper submissions from 49 countries. To evaluate each submission, a double blind paper review was performed by the Program Committee. After a stringent selection process, 29.01% of the papers were published and presented as full papers, i.e. completed work (12 pages/25’ oral presentation).

Three invited talks were delivered by internationally distinguished speakers, namely:
• Federico Cabitza, Universit`a degli Studi di Milano-Bicocca, Italy
• Katja B¨uhler, VRVis, Austria
• Ana Rita Londral, Universidade NOVA de Lisboa, Portugal

Additionally, the conference acknowledged "Best Paper Awards", "Best Student Paper Awards", “Best Poster Awards”, and one “Best PhD Project Award”, which were all conferred at the conference venue. More information can be found at: https://biostec.scitevents.org/PreviousAwards.aspx

17th Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI 2022)

Online 03/07/2022-03/10/2022
https://humanrobotinteraction.org/2022

The ACM/IEEE International Conference on Human-Robot Interaction (HRI) is the premium venue for publishing and presenting top-quality HRI research. The 17th Annual ACM/IEEE International Conference on Human-Robot Interaction (HRI 2022) took place during March 7-10 as a virtual conference. This was the third time that the HRI research community could not meet in person, because of the COVID-19 pandemic; originally, we planned and hoped for at least a hybrid conference to be hosted in Sapporo, to finally bring back the conference to Japan.

This year’s conference attracted 234 full paper submissions from 30 unique countries in Asia-Pacific, Europe, the Middle East, and North America. Each full paper was aligned with a theme-appropriate subcommittee, and subsequently reviewed through a double-blind process, which was followed by a rebuttal phase, and shepherding where found appropriate by the program committee. As a result of the review process, the program committee selected 57 (24.36%) of the submissions for presentation as full papers at the conference. As the conference is jointly sponsored by IEEE and ACM, papers are archived in both the ACM Digital Library and the IEEE Xplore. Along with the full papers, the conference program and proceedings include Short Contributions, Late-Breaking Reports, Videos & Demos, Alt.HRI, and a Student Design Competition section. Finally, the virtual format allowed us to have 21 workshops framing our conference program, including the HRI Pioneers workshop promoting and highlighting especially the work of early-career researchers in the field.

Our program also included three dynamic
keynote speakers, who all break boundaries with their highly trans- and interdisciplinary research:

- Hiroshi Nittono (Cognitive Psychophysiology Laboratory, Osaka University),
- Leila Takayama (University of California, Santa Cruz)
- Friederike Eyssel (Bielefeld University, Germany).

HRI 2022 was made possible through the significant volunteer efforts of the organizing committee, program committee, reviewers, and steering committee. We thank the keynote speakers, financial supporters, and international reviewers for their support and participation. The conference is sponsored by ACM SIGCHI, ACM SIGAI, IEEE Robotics and Automation Society, and is in cooperation with AAAI and HFES.

**Autonomous Agents and Multi-Agent Systems (AAMAS 2022)**

*Online 05/09/2022-05/13/2022*
https://aamas2022-conference.auckland.ac.nz

The 2022 edition of AAMAS, the International Conference on Autonomous Agents and Multi-Agent Systems, took place from the 9th to 13th of May 2022 (aamas2022-conference.auckland.ac.nz). This year it was organized in the form of a virtual event and attracted over 577 registered participants. As every year, the conference featured an exciting program of contributed talks, keynotes addresses, tutorials, affiliated workshops, a doctoral consortium, demos, blue sky ideas, and diversity and inclusion activities.

AAMAS is the largest and most influential conference in the area of agents and multiagent systems. The aim of the conference is to bring together researchers and practitioners in all areas of agent technology and to provide a single, high-profile, internationally renowned forum for research in the theory and practice of autonomous agents and multiagent systems. AAMAS is the flagship conference of the non-profit International Foundation for Autonomous Agents and Multiagent Systems (IFAAAMAS). The conference featured three keynote speakers.

- Shafi Goldwasser, Director of Simons Institute for the Theory of Computing and Professor at UC Berkeley (EECS), MIT (EECS) and Weizmann Institute (CS, Applied Math), *Safe Machine Learning: Robustness, Verification and Privacy*.
- Mark Sagar, co-founder and CEO of Soul Machines and director of the Laboratory for Animate Technologies at the Auckland Bioengineering Institute, *Autonomous Animation*.
- Johanna Seibt, Professor, Research Unit for Robophilosophy and Integrative Social Robotics, Aarhus University, *The Aims of Social Robotics*.

Two further invited talks were given on the occasion of receiving:

- ACM/SIGAI Autonomous Agents Award: Maria Gini, College of Science & Engineering Distinguished Professor in the Department of Computer Science and Engineering at the University of Minnesota, *Decentralised Allocation of Tasks to Agents and Robots*.

Several other awards were given:

**Best paper winner** Ashay Aswale, Antonio Lopez, Aukkawut Ammartayakun and Carlo Pinciroli, *Hacking the Colony: On the Disruptive Effect of Misleading Pheromone and How to Defend against It*

**Best paper runner-up** Aleksander Czechowski and Georgios Piliouras, *Poincaré-Bendixson Limit Sets in Multi-Agent Learning*

**Best paper runner-up** Matthieu Geist, Julien Pérolat, Mathieu Laurière, Romuald Elie, Sarah Perrin, Oliver Bachem, Rémi Munos and Olivier Pietquin, *Concave Utility Reinforcement Learning: the Mean-field Game viewpoint*

**Best student paper winner** George Li, Ann Li, Madhav Marathe, Aravind Srinivasan,
Leonidas Tsepenekas and Anil Kumar Vulkanti, *Deploying Vaccine Distribution Sites for Improved Accessibility and Equity to Support Pandemic Response*

**Best student paper runner-up** Aaquib Tabrez, Matthew B. Luebbers and Bradley Hayes, *Descriptive and Prescriptive Visual Guidance to Improve Shared Situational Awareness in Human-Robot Teaming*

**Best Demo Award** Naman Shah, Pulkit Verma, Trevor Angle and Siddharth Srivastava, *JEDAI: A System for Skill-Aligned Explainable Robot Planning*

**Best Poster Award** Michał Zawalski, Blażej Osiński, Henryk Michalewski and Piotr Miloś, *Off-Policy Correction For Multi-Agent Reinforcement Learning*

**Best Video Award** Peizhu Qian and Vaibhav Unhelkar, *Evaluating the Role of Interactivity on Improving Transparency in Autonomous Agents*

The proceedings can be found at: [https://dl.acm.org/doi/proceedings/10.5555/3535850](https://dl.acm.org/doi/proceedings/10.5555/3535850)

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**Louise Dennis** is the Conference Coordination Officer for ACM SIGAI, and a faculty member at the University of Manchester. Her research is in Verification of Autonomous Systems, Cognitive Agents and Machine Ethics. Contact her at [louise.dennis@manchester.ac.uk](mailto:louise.dennis@manchester.ac.uk).
This section features information about upcoming events relevant to the readers of AI Matters, including those supported by SIGAI. We would love to hear from you if you are organizing an event and would be interested in cooperating with SIGAI. For more information about conference support visit sigai.acm.org/activities/requesting_sponsorship.html.

The 5th AAAI/ACM Conference on Artificial Intelligence, Ethics, and Society (AIES 2022)
Oxford, England, August 1-3, 2022
https://www.aies-conference.com/2022/
Artificial Intelligence (AI) continues to see heavy investments from industry and governments around the world. With this in mind, AIES is convened each year by program co-chairs from Computer Science, Law and Policy, the Social Sciences, Ethics and Philosophy with the goal of encouraging talented scholars in these and related fields to submit their best work related to morality, law, policy, psychology, the other social sciences, and AI. Papers tailored for a multi-disciplinary audience without sacrificing excellence will be presented at the conference. In addition to the community of scholars who have participated in these discussions from the outset, they explicitly welcome disciplinary experts who are newer to this topic, and see ways to break new ground in their own fields by thinking about AI.

AIES-22 is a hybrid conference, with registration tiers specific to in-person and virtual attendance. For information on registering, please refer to the conference website.

The 22nd ACM International Conference on Intelligent Virtual Agents (IVA 2022)
Faro, Portugal, September 6-9, 2022
https://ivaconference2022.ualg.pt/

ACM IVA 2022 will be the 22nd meeting of an interdisciplinary annual conference and the main leading scientific forum for presenting research on modeling, developing, and evaluating intelligent virtual agents (IVAs) with a specific focus on the ability to socially interact. IVA 2022 aims to showcase cutting-edge research on the design, application, and evaluation of IVAs, as well as the basic research underlying the technology that supports human-agent interaction such as social perception, dialog modeling, and social behavior planning. The conference will also include submissions on central theoretical issues, uses of virtual agents in psychological research, and showcases of working applications.

Students, academics, and industry professionals with an interest in learning about and presenting the most cutting-edge research conducted today in the multi-disciplinary field of intelligent virtual agents are invited to attend the conference. Researchers from the fields of human-human and human-robot interaction are also encouraged to share work with relevance to IVAs.

For information on registrations, please refer to the conference website.

The 16th ACM Conference on Recommender Systems (RecSys 2022)
Seattle, USA, September 18-23, 2022
https://recsys.acm.org/recsys22/
The ACM Conference on Recommender Systems (RecSys) is the premier international forum for the presentation of new research results, systems and techniques in the broad field of recommender systems. RecSys brings together the major international research groups working on recommender systems, along with many of the world's leading companies active in e-commerce and other adjacent domains. It has become the most important annual conference for the presentation and discussion of recommender systems research. It will bring together researchers
and practitioners from academia and industry to present their latest results and identify new trends and challenges in providing recommendation components in a range of innovative application contexts. In addition to the main technical track, the RecSys 2022 program will feature keynote and invited talks, tutorials covering state-of-the-art in this domain, a workshop program, an industrial track and a doctoral symposium.

RecSys is following a hybrid conference format, with a physical conference in Seattle along with a virtual option that makes remote attendance possible for those who need it. For information on registrations, please refer to the conference website.

The 2nd International Conference on AI-ML Systems (AIMLSystems 2022)
Bangalore, India, October 12-15, 2022
https://www.aiml-systems.org/2022/
AIMLSystems is a new conference targeting the research in the intersection of Systems Engineering and Artificial Intelligence and Machine Learning techniques. The conference envisions to examine how immense strides in AI/ML techniques are made possible through advances in the computational systems and how the use of AI/ML can help in the data-driven explorations of the design space of the computational systems. They also investigate how new breeds of AI/ML systems enable new forms of socio-techno-economic systems and in turn generate new requirements for research in AI/ML techniques.

AIMLSystems will be held as a hybrid conference facilitating both physical and virtual participation. For information on registrations, please refer to the conference website.

The 21st IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT 2022)
Niagara Falls, Canada, November 17-20, 2022
The 2022 IEEE/WIC/ACM International Conference on Web Intelligence and Intelligent Agent Technology (WI-IAT’22) provides a premier international forum to bring together researchers and practitioners from diverse fields for presentation of original research results, as well as exchange and dissemination of innovative and practical development experiences on Web intelligence and intelligent agent technology research and applications.

The conference aims to achieve a multidisciplinary balance between research advances in theories and methods usually associated with collective intelligence, data science, human-centric computing, knowledge management, network science, autonomous agents and multi-agent systems. It is committed to addressing research that both deepen the understanding of computational, logical, cognitive, physical, and social foundations of the future Web, and enable the development and application of intelligent technologies.

Early registrations open on August 20, 2022 and for more information on registrations, please refer to the conference website. Submission deadline: Workshops/Special sessions paper submission: August 22, 2022

The 2nd ACM conference on Equity and Access in Algorithms, Mechanisms, and Optimization (EAAMO 2022)
Arlington VA, USA, October 6-9, 2022
https://eaamo.org/
EAAMO’22 is organized by the Mechanism Design for Social Good (MD4SG) initiative, and builds on the MD4SG technical workshop series and tutorials at conferences including ACM EC, ACM COMPASS, ACM FAccT and WINE. The conference will feature keynote talks, panels, and contributed presentations across numerous fields. In line with the MD4SG core values of bridging research and practice, the conference will bring together researchers, policy-makers, and practitioners in various government and non-government organizations, community organizations, and industry to build multi-disciplinary pipelines.

The conference aims to highlight work where techniques from algorithms, optimization, and mechanism design, along with insights from the social sciences and humanistic studies,
and to help improve equity and access to opportunity for historically disadvantaged and underserved communities. It will provide an international forum for presenting research papers, problem pitches, survey and position papers, new datasets, and software demonstrations towards the goal of bridging research and practice.

For more information on registrations, please refer to the conference website.

The 14th International Joint Conference on Computational Intelligence (IJCCI 2022)
Valletta, Malta, October 24-26, 2022
https://ijcci.scitevents.org/
The purpose of IJCCI is to bring together researchers, engineers and practitioners on the areas of Fuzzy Computation, Evolutionary Computation and Neural Computation. IJCCI is composed of three co-located conferences (International Conference on Fuzzy Computation Theory and Application, International Conference on Evolutionary Computation Theory and Applications, and International Conference on Neural Computation Theory and Applications) each specialised in at least one of the aforementioned main knowledge areas.

For more information on registrations, please refer to the conference website.

The 14th International Conference on Knowledge Discovery, Knowledge Engineering, and Knowledge Management (IC3K 2022)
Valletta, Malta, October 24-26, 2022
https://ic3k.scitevents.org/
The purpose of IC3K is to bring together researchers, engineers and practitioners on the areas of Knowledge Discovery, Knowledge Engineering and Knowledge Management. It is composed of three co-located conferences: International Conference on Knowledge Discovery and Information Retrieval, International Conference on Knowledge Engineering and Ontology Development, and International Conference on Knowledge Management and Information Systems.

For more information on registrations, please refer to the conference website.

The 17th International Conference on the Foundations of Digital Games (FDG 2022)
Athens, Greece, September 5-8, 2022
http://fdg2022.org/
The theme of FDG 2022 is 'games as culture and communication'; the theme suggests that, going beyond their use for entertainment, games can function as cultural artifacts by incorporating the values, beliefs and aspirations of designers, developers, and players. The conference identifies that game mechanics and aesthetics also provide valuable information relating to culture, society, politics, and a variety of other themes, both global and niche. They challenge current practices in user studies, game technology, game design and evaluation, fostering better representation and inclusion, and a deeper understanding of the user experience. More broadly, it incentivises surveys and meta-reviews of past work, as well as vision papers related to the current and future societal and cultural context.

FDG 2022 has received 160 submissions in nine different research tracks, the doctoral consortium and the demos session. In addition, the conference includes six different workshops, some with a long history with FDG, such as the 13th Workshop on Procedural Content Generation and the 4th Workshop on Tabletop Games, while the two workshops: Games and the Metaverse, and Developing Digital Games in and for Academic Contexts workshops, which appear for the first time, reflect the current trends in games-related research. Keynote themes include city and world building, philosophy of digital games, and game/gamer communities and inclusion.

More details will be announced on the conference website and social media (https://www.facebook.com/FDGconf/ and https://twitter.com/FDGconf). For more information on registrations, please refer to the conference website.
The 36th International Conference on Industrial, Engineering and Other Applications of Applied Intelligent Systems (IEA/AIE 2023)
Shanghai, China, July 19-22, 2023
http://www.ieaie2023.com/
IEA/AIE 2023 is a contributing series that is publishing high quality research work in advanced artificial intelligence and its application. It emphasises on applications of applied intelligent systems to solve real-life problems in all areas including engineering, science, industry, automation and robotics, business and finance, medicine and biomedicine, bioinformatics, cyberspace, and human-machine interactions. The topics of interest for submissions include adaptive control, autonomous agents, computer vision, data mining, games, machine learning, robotics, and ontologies among others. In addition to the main conference track, there will also be two special sessions on collective intelligence in social media and intelligent knowledge engineering in decision making systems. The conference will also publish a special issue in Applied Intelligence, after the conference selecting the best papers in terms of quality, reviews, and presentation.

The conference has a category of the best student paper award, selected from the best student submissions based on quality and novelty. This will offer free registration fee for the best student paper and possible travel (if traveling is allowed) to the awarded winner. Also, there is other category for best technical paper and best theory paper that also has free special registration award, offered by Springer. The best papers of the conference will be selected as presented papers, and will be announced for Special issue in Applied Intelligence journal.

Submission deadline: December 15, 2022

The 22nd International Conference on Autonomous Agents and Multiagent Systems (AAMAS 2023)
London, England, May 29-June 2, 2023
https://aamas2023.soton.ac.uk/
AAMAS is the largest and most influential conference in the area of agents and multiagent systems. The aim of the conference is to bring together researchers and practitioners in all areas of agent technology and to provide a high-profile, internationally renowned forum for research in the theory and practice of autonomous agents and multiagent systems. AAMAS is the flagship conference of the non-profit International Foundation for Autonomous Agents and Multiagent Systems (IFAAMAS).

AAMAS 2023 is the 22nd edition of the AAMAS conference, and after three years of virtual AAMAS conferences, the conference is planned to be held in-person in London. The conference solicits papers addressing original research on autonomous agents and their interaction, including agents that interact with humans. In addition to the main track, there will be two special tracks: Blue Sky Ideas and JAAMAS.

Submission deadline: October 28, 2022

The 28th Annual Conference on Intelligent User Interfaces (IUI 2023)
Sydney, Australia, March 27-31, 2023
https://iui.acm.org/2023/
ACM Conference on Intelligent User Interfaces (ACM IUI) 2023 is the 28th annual premiere venue, where researchers and practitioners will meet and discuss state-of-the-art advances at the intersection of Artificial Intelligence (AI) and Human-Computer Interaction (HCI). Ideal IUI submissions should address practical HCI challenges using machine intelligence and discuss both computational and human-centric aspects of such methodologies, techniques, and systems.

The theme for this year will be Resilience, covering a wide variety of topics, such as COVID-19 recovery, organizational cyber resilience, economic growth and stability, climate change recovery, intelligent user interface resilience, and similars. While submissions related to this theme are encouraged, the scope of the conference is not limited to the theme only.

Contributions to IUI are expected to be supported by rigorous evidence appropriate to the claims (e.g., user study, system evaluation, computational analysis), and are welcome from all relevant arenas, including academia, industry, government, and non-profit organizations. The conference will accept papers for both long and short oral presentations.

Submission deadline: Abstract submission:
Dilini Samarasinghe is the Assistant Conference Coordination Officer for ACM SIGAI, and a research associate at the University of New South Wales. Her research is in Artificial Intelligence, Multi-agent Systems and Evolutionary Computation. Contact her at d.samarasinghe@adfa.edu.au.
EAAI-22 Blue Sky Ideas in Artificial Intelligence Education from the AAAI/ACM SIGAI New and Future AI Educator Program

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Introduction

The 12th Symposium on Educational Advances in Artificial Intelligence (EAAI–22, co-chaired by Michael Guerzhoy and Marion Neumann) continued the AAAI/ACM SIGAI New and Future AI Educator Program to support the training of early-career university faculty, secondary school faculty, and future educators (PhD candidates or postdocs who intend a career in academia). As part of the program, awardees were asked to address one of the following “blue sky” questions:

• How could/should AI courses incorporate AI Ethics into the curriculum?
• How could we teach AI topics at an early undergraduate or a secondary school level?
• AI has the potential for broad impact to numerous disciplines. How could we make AI education more interdisciplinary, specifically to benefit non-engineering fields?
• How should standard AI courses evolve?
• How could we leverage AI education to promote diversity in the field?

This paper is a collection of their responses, intended to help motivate discussion around these issues in AI education.

AI education can be leveraged to promote diversity in the field through various approaches

Emmanuel Johnson (Information Sciences Institute, University of Southern California)

In this essay, I will focus on two of the most promising approaches. First, we must make AI education more accessible to diverse populations. For instance, there are 101 Historically Black Colleges and Universities [1]; however, less than 20 offer AI courses [2]. We must find ways to bring AI education to these HBCU students. One method to do this is through a Distributive Teaching Collaborative (DTC). Through a DTC, professors from institutions with a strong AI program partner with those at institutions without a strong AI program to leverage online learning platforms to co-teach courses in Artificial Intelligence. These courses are taught simultaneously where a professor at one institution may present the lecture while students at another institution can ask questions and engage with the professor lecturing. Through this method, students can also be paired in groups across institutions, and this type of learning provides benefits for all students. Students are exposed to classmates from different backgrounds who may approach problems in different ways. This could also help to reduce bias in AI systems that may arise from a lack of exposure to different experiences or test cases. In addition to making AI education more accessible, we must design AI curricula that help...
students from diverse backgrounds develop the skills needed to solve their community’s problems. The groups underrepresented in AI are often overrepresented in other fields. For example, African Americans are underrepresented in STEM majors but overrepresented in social work [3]. One possible explanation is that fields like social work are critical for community and political movements in low-income and minority communities [4]. Thus, students pursue these degrees in hopes of having an impact in their community. It is worth considering how artificial intelligence curriculum can address the needs of minority communities thus providing an avenue for attracting more students who have an interest in building their communities. Initiatives like AI for Social Good provide a model that we can follow. By building a more inclusive AI curriculum that empowers students from all backgrounds and providing access to such a curriculum, we can help to increase the diversity in artificial intelligence.

References

Embodied AI Ethics
David Johnson (Uppsala University)

Democratizing AI can only be achieved by mainstreaming AI education and a key challenge is in lowering the barriers to understanding AI concepts. Something that we explore in our teaching of AI is not presuming of our students a deep understanding of computation or mathematics, and by conveying key AI concepts to students outside of the computer – an “unplugged” approach. We submit that teaching AI ethics can be “unplugged” by putting students in situ and embodying the components of an AI/ML workflow. The constituent approaches are not entirely novel; an established approach to computer science education is in CS Unplugged [1] and there are several recent efforts that are self-labelled “AI Unplugged”, while embodied design has long been integrated into mathematics pedagogies [2].

The idea of embodying AI ethics is captured in a workshop that we run with our students about algorithmic accountability that we describe in brief here: Students work in teams of 4, where each team is tasked with developing a movie ranking service and are given a small example database of movies to analyse. Team members are set specific roles of a manager, data pre-processor, predictor, and a visualizer. The team, altogether, first determines what features to select from the example data and develops rules to apply to generate their ranking. Next, some new unseen data is distributed to each team, and each team manually processes it. The manager is responsible for collecting the data and signalling when the ranking is completed. The data pre-processor receives the raw data from the manager and manually copies it to a new table according to any agree feature selection and pre-processing. The predictor then receives the pre-processed table and applies the prediction rules to add a column with predictions. Finally, the visualizer takes this table from the predictor and copies it manually to a rank-ordered list of movie names that is passed back to the manager.

Each student in the team takes a physical role with which to fulfil the movie rank prediction workflow. When performing the workflow, each not only does some processing but also receives and sends data. The team embodies the workflow, and the individuals gain a unique experience (within their team) in their embodied role. Fairness and accountability are then discussed as a class relating to the data and algorithmic processing, where we would expect multiple viewpoints given the heterogeneous roles. This is just one example of learning AI ethics with such an approach. We plan to further develop a collection of embodied AI ethics activities with a view to evaluating them for inclusion in AI education curricula.

References
Multidisciplinary Ethics in AI

Henry Chai (Carnegie Mellon University)

In my introduction to machine learning courses, I typically devote one lecture to fairness and bias in machine learning, usually near the end of the semester. However, recently I’ve been somewhat unsatisfied with these lectures: 80 minutes is just not enough time to cover such an important topic with any amount of meaningful depth. I find myself devoting most of that time to going over examples of bias in notable/interesting settings. These examples are really the highlight of that lecture: they resonate with students and make for easy engagement exercises, i.e., challenging students to identify which protected groups are at risk or how bias is introduced in each setting. Of course, I use real world examples in most if not all of my lectures to motivate the particular algorithm or method being taught: if examples are the most compelling way to discuss the ethical aspects of machine learning, then why not apply these bias and fairness exercises to all of those examples as well?

I’m excited to do exactly that this in future iterations of my introductory courses: instead of restricting the discussion of fairness and bias in machine learning to a single lecture, I intend to spread that content out over the semester and get students thinking about these issues regularly and in a variety of contexts. I plan to start early in the semester, in the very first lecture, where I introduce the basic notation and problem formulation of supervised machine learning using an example of a bank deciding who to extend credit and how much, an easy example with which to introduce ethics questions.

In terms of a grander, more pie-in-the-sky answer, I suspect most in the field would agree that a course in ethics should be required for all students, graduate and undergraduate, studying data science, artificial intelligence, machine learning or any related field. I strongly believe that these courses should be heavily interdisciplinary: at a minimum, they ought to include material drawn from the fields of philosophy and law to address questions like “what does it mean for an algorithm to be just or fair?” and “why should one value those traits in an algorithm?” In my personal experience, the most successful machine learning projects have involved domain experts and I believe the same approach should extend to how we teach all aspects of machine learning, including fairness and bias.

To facilitate the development of such courses, I envision the creation of an entity or organization that functions much like an institution’s center for teaching and learning (indeed, such a group could be initially housed in these centers) expect with an exclusive focus on unifying and supporting the instruction of ethics. Notably, this governing body would not be restricted to just AI ethics but ethics across all subject areas and thus, would be inherently multidisciplinary. The roles that such an organization could take on are many but some possibilities include reviewing existing courses and suggesting places to incorporate ethics modules, developing and tailoring the aforementioned ethics modules to different domains as well as establishing guidelines and curricula for standalone ethics courses.

Bridging the gap between AI courses and Open Science

Daniel Garijo (Universidad Politécnica de Madrid)

Due to the rise in popularity of Machine Learning (ML) techniques, universities around the globe have started incorporating Data Science as part of their courses. Frameworks such as ScikitLearn [1], TensorFlow [2] and Pytorch [3] have eased the adoption of ML tools, and are used by students to address many types of classification and regression problems.

AI courses usually provide a theoretical explanation for popular AI techniques, but major challenges regarding data integration, representation, modeling, collection and cleaning remain, in many cases, unaddressed. Based in my experiences at both the University of Southern California and Universidad Politécnica de Madrid, I believe AI-focused courses should evolve towards including:

1. **Basic data modeling and representation**: Data quality is paramount to ML applications. The Web is full of rich data that can be used to train ML algorithms, but that can be difficult to find and integrate together. Students should learn how to understand and represent the data they feed into their algorithms. Having a good notion in data modeling and representation helps expanding training corpora, which may significantly improve the final results of the ML algorithm chosen at the end.

2. **Best practices for reproducible results**: A data science project never ends just by training and testing a model. In order for the results to be useful, students should learn how to document the features, biases and limitations of
their projects, to record the input and parameters used in training and to preserve the computational environment used to perform the analysis. AI courses should incorporate best practices for reproducibility, in order to make the results of a model (and the model itself) Findable, Accessible, Interoperable and Reusable (FAIR) [4] by others.

3. **Accessibility for non-experts**: AI courses use many research software components, some of which may not be easy to adopt by wider audiences. In order to welcome students from other areas besides Computer Science, AI courses should include introductory materials for using command line interfaces, teach how to read software documentation, and teach how to install virtual environments and package managers such as PyPi [5] and Conda [6]. These skills are crucial when testing the results from colleagues and exploring novel algorithms.

References


[6] https://docs.conda.io/

AI has the potential for broad impact to numerous disciplines. How could we make AI education more interdisciplinary?

Zhuoyue Lyu (University of Toronto)

Our EAAI paper [1] explored the idea of teaching AI in an interdisciplinary setting integrating STEM with the humanities. We developed a high school AI lesson focusing on teaching Variational Autoencoder (VAE) through philosophical metaphors, creative art, and music applications. The pilot studies with 22 students found that our approach was effective.

Students in our study were fascinated by the creativity of AI. To them, AI was not just something that predicted their next YouTube video or the Face ID system on their phones anymore. It’s much bigger. It’s lively, vibrant, and creative. They even understood the connection between AI and philosophy. Plato’s cave is an allegory that is 2400 years old, and it’s somewhat abstract and obscure. Nevertheless, students were able to utilize that to learn the concept of Latent Space in the VAE model without problems.

As a (non-professional) singer and podcaster myself, I enjoy finding the connection between STEM and humanities, which is also the vision of many researchers who built amazing AIs such as MusicVAE [2], SketchRNN [3], Pointflow [4], that received great feedback from the public. So let us keep exploring AI’s connection with other disciplines and integrating more non-engineering examples into our curriculum.

Why is this important? Because AI should be human-centered, and our next generations of scientists, engineers, and policymakers need to understand and agree with that idea. The humanities are a powerful way to achieve that as it’s the utmost expression of human creativity and imagination that can resonate with people regardless of their nations and identities.

References


How to make AI more interdisciplinary
Christopher J. MacLellan (Drexel University)

I argue that by developed specialized educational AI resources for Human-Computer Interaction (HCI) students and practitioners, we can make AI more interdisciplinary and empower this audience to create the human-centered AI systems of the future. As a researcher working at the intersection of AI and HCI, I have discovered that many HCI students and practitioners have a limited view of AI. They often view AI as a collection of isolated algorithms for specific purposes (e.g., classification or recommendation) and lack an understanding of how different AI components integrate to produce intelligent behavior. Further, their understanding also often omits key topics and theoretical ideas, such as expert systems, analogical reasoning, and creativity. HCI practitioners are eager to leverage AI advancements, but these fundamental deficiencies limit the kinds of human-centered technologies they might one day create.

To address these deficiencies, I have been developing a graduate-level course on Human-AI Interaction for Drexel University’s HCI and User Experience (UX) master’s program. The course aims to introduce students to AI concepts as well as the unique design challenges faced when integrating AI into user-facing technologies. Over the term, students read and discuss papers that intentionally include a broad range of perspective on AI topics (e.g., readings were selected to represent different sociocultural and AI perspectives). The central goal for the readings is to help students gain a broader understanding of AI approaches and how these approaches can be integrated to support human-centered design. In conjunction with the readings, students work on interdisciplinary teams to design a user-facing AI prototype.

Even though many of my students came to the course with limited technical experience, they were all able to successfully produce and present AI prototypes by the end of the term. Further, many of them developed compelling concepts at the intersection of AI and HCI. For example, one group of students explored the development of a novel interactive voice assistant that leveraged both a rule-based dialog system and speech-to-text functionality to support elderly people in tracking and managing chronic health conditions. Another group explored novel ways for users to provide temporally scoped preference information to recommender systems (e.g., I love this song, but I do not want to hear this song for the next few weeks) and reimagined what a system like Spotify would look like with these new capabilities.

While I originally designed the course to help HCI students advance their AI knowledge, I found that these students bring a fresh, interdisciplinary perspective to the AI discipline itself. HCI students almost always start by considering the human context for AI technologies and as a result they would often identify ways that widely use AI design patterns (e.g., recommender systems that only accept binary yes/no feedback) are insufficient. I argue that by creating more courses that bridge the HCI and AI disciplines, we can both increase the impact of AI technologies and enrich our discipline.

Acknowledgments
The EAAI–22 AAAI/ACM SIGAI New and Future AI Educator Program is partly supported by funding from ACM SIGAI and the Artificial Intelligence Journal.

Michael Guerzhoy is a Assistant Professor, Teaching Stream at the University of Toronto, and an Affiliate Scientist at the Li Ka Shing Knowledge Institute, St. Michael’s Hospital. His professional interests are in computer science and data science education and in applications of machine learning to healthcare.

Marion Neumann is a Teaching Professor and the Director of Data Science Programs at the Department of Computer Science and Engineering at Washington University in St. Louis. She teaches Machine Learning, Analysis of Networked Data, and Introduction to Data Science. Her research interests include graph-based machine learning and capturing and analyzing student feedback and emotions in large computer courses using text mining and sentiment analysis.

Emmanuel Johnson is a postdoctoral research associate at the University of Southern California’s Information Sciences Institute through a CI Fellowship. His research explores building AI systems for teaching interpersonal skills.
David Johnson is an Associate Professor at the Department of Informatics and Media at Uppsala University in Sweden and a Visiting Fellow at Kellogg College, University of Oxford, UK. His research interests relate to data infrastructures, artificial intelligence, and AI education.

Henry Chai is a teaching postdoctoral fellow in the machine learning department at Carnegie Mellon University where he teaches a variety of courses all titled “Introduction to Machine Learning”. He completed his Ph.D. under the supervision of Dr. Roman Garnett at Washington University in St. Louis, where he also taught introductory and advanced machine learning courses. His dissertation research was in the intersection of probabilistic numerics and active learning: it can be succinctly summarized by the following question: “how can we efficiently and accurately reason about inherently intractable quantities?”

Daniel Garijo is a Distinguished Researcher at the Ontology Engineering Group of the Universidad Politécnica de Madrid, where he teaches courses on Knowledge Representation, Open Science and Data Science. Daniel’s research focuses on improving the understandability and reusability of Research Software by exploiting its documentation in an automated manner.

Zhuoyue Lyu is an incoming Master’s student in Education at Harvard University. He completed his Bachelor’s in Computer Science (AI) at the University of Toronto. He is passionate about finding connections between STEM and humanities. https://www.zhuoyuelyu.com/

Chris MacLellan is an Assistant Professor of Information Science and Computer Science (by co-appointment) at Drexel University, where he leads the Teachable AI Lab. His work on cognitive systems aims to advance our understanding of how people teach and learn and to build AI systems that can teach and learn like people do and in ways that are compatible with people. Prior to joining Drexel, Chris completed his Ph.D in Human-Computer Interaction at Carnegie Mellon University, where he was a fellow in the Program for Interdisciplinary Education Research (PIER). In 2021 he was named on Technical.ly’s RealLIST of technologists building Philadelphia’s future. He is also a founding member of the NSF funded National AI Institute for Adult Learning and Online Education (AI-ALOE; https://aialoe.org/) and a principal investigator on multiple projects that are funded by the DARPA and ARL.
AI Education Matters: Guiding our Future AI Leaders with Joy and Justice

Yim Register, Joseph William Tan Garcia, Nayan Kaushal, Dev Wilder, Xiaobing Xu
(University of Washington; yreg@uw.edu)
DOI: 10.1145/3557785.3557790

Introduction

I always say to my students “you are going to be the future data science leaders of the world”. Wherever they end up, I hope they apply critical (Cotter, 2020; Dasgupta & Hill, 2020) and human-centered (Xu, 2019) thinking to the AI decisions they make. As AI algorithms become ever more omnipresent in our lives – from newsfeed organization to product recommendations and beyond – it is our responsibility as educators to equip our students with the necessary tools to interrogate the impacts of AI technology. Luckily, there has been a large push for the integration of ethics into AI curricula. Whether this is in Model AI assignments (Furey & Martin, 2019) or entire conferences (such as FAccT), there is a demand for integrated and critical algorithmic literacies both in the classroom and outside of it.

As a social media researcher and AI educator, my work regularly contends with two pillars: Joy and Justice. In this article I intend to outline ways of integrating both play and critical interrogation into AI education, with examples from AI education scholarship (Druga, Vu, Likhith, & Qiu, 2019; Ko et al., 2020) as well as a light experience report highlighting student work. My students join me on this article as they are the main inspiration for innovative joy and justice practices!

Joy

Computing can be filled with joy. We create games (Neller, 2019), robots (Dodds, Greenwald, Howard, Tejada, & Weinberg, 2006; Williams, Kaputsos, & Breazeal, 2021), books (Liukas, 2015), and whole languages (Maloney, Resnick, Rusk, Silverman, & Eastmond, 2010) centered around computing and play. Constructionism (Papert, 2020) has guided computing education in countless ways. AI education specifically has exploded with lessons and tools that center on joy and playfulness: (Giannakos, Voulgari, Papavlasopoulou, Papamitsiou, & Yannakakis, 2020; Fiebrink, 2019; Huppenkothen & Eadie, 2021). Play can span all ages, and is not just for children. One only needs to think of social media face filters to recognize the abundance of AI-mediated play at any age.

Justice

Computing can be centered around justice. AI technology in particular is used across industries that affect human lives: such as medicine, law, education, finance, and media (Chui et al., 2018). Recent years have shown increased interest in quantifying, discussing, and remediating AI bias and algorithmic harm (Kordzadeh & Ghasemaghaei, 2021). As we continue to work on combating algorithmic bias, as well as questioning what algorithmic systems should even be produced, we are also grappling with how to teach these critical skills in the AI classroom. (Ali, Payne, Williams, Park, & Breazeal, 2019) has demonstrated several activities for ethical AI that include: students creating an ethical matrix for a YouTube Recommendation algorithm as well as discussing bias in facial recognition (Buolamwini & Gebru, 2018).

Computing education academics, large tech companies (e.g. Google PAIR), and corporate training programs are continuing to explore ways to integrate justice-oriented concepts into AI education – and it is imperative that all AI education grapples with the impacts of algorithms on human lives (Borenstein & Howard, 2021).

Model AI Assignment: Zombie KNN

Our recent Model AI assignment attempted to integrate both joy and justice into a zombie apocalypse themed lesson on the algorithm k-nearest neighbors. Equipped with a map and
“data radioed in from the nearby town”, middle school students try to compute where zombies tend to congregate – in order to ensure safe passage through the variety of locations on the map. Given data from the nearby town, students try to determine the most similar locations in their own town, and draw inferences about the likely number of zombies assembled there. The lesson pivots to questions of accuracy and the risks of ‘getting it wrong’. What if there are 2 zombies where you predicted 1? What if there are 100 where you predicted 1? What are the costs and risks of a wrong prediction? The lesson then engages students in thinking about medical AI decisions, and encourages students to think critically around accuracy thresholds and certainty, as well as potential consequences and benefits of prediction.

Master’s Level Final Project: Choose Your Own Adventure

I designed the final project for the Information Management Master’s course on Machine Learning and Econometrics, titled: Choose Your Own Adventure, a play on books and video games where an individual chooses their own path in a series of decisions. Students choose an algorithm, a dataset, a research question, and a visualization – all culminating in an analysis of how their project might be used for good in the world, and how it may be misused and lead to harm. Students engaged in a wide variety of disciplines, and I provide some examples of their work below:

- Computing a walkability score around the city using satellite images: “these models don’t generalize to everyone, and there could be poor representation for children, disabled people, and the elderly. We need to adjust the model to be more inclusive and specifically serve their needs”
- Automatically detecting levels of fentanyl in a blood sample: “it doesn’t take into account the socioeconomic factors that facilitate fatal drug use. It's not just the fentanyl. Mental illness is not a binary either. There needs to be a more nuanced view of mental wellness and addiction”
- Heart disease detection: “there is a long standing history of medical studies only collecting health data from white males. This can be highly consequential for diagnosis and treatment. It is vital these datasets are more representative”
- Product recommendation: “we do mess with the user’s thought process by making them think they NEED a particular product when in fact it's just the result of targeted marketing”

Conclusion

As we continue to find more use cases for AI technology, we are also discovering new evidence of bias impacting stakeholders of these models. As educators, we can carefully guide our students to critically interrogate any AI use case, from the overall design to the details of interpreting the F1 score. I join other AI educators in finding creative ways to celebrate the joy of computing while remaining justice-oriented at the core. “Because we can” transforms into “Because it matters”.

References


Yim Register is a PhD candidate at UW. They study how users resist algorithmic harm on social media, and how AI educators can prepare students to create more inclusive and trauma-informed AI projects.

Nayan Kaushal is a graduate student at the UW specializing in Data Science. He intends to use data-driven socially responsible approaches to solving social justice problems.

Dev Wilder is an MLIS candidate at UW concentrating in Health Science Librarianship and Data Science. She studies information access, education, misinformation, and the impact of data visualizations on different marginalized communities.

Joseph William Tan Garcia is an M.S. in Information Management candidate at the UW. He has a passion for exploring health equity in tech. He believes in critical investigation of technology and how people engage with their digital environments.

Xiaobing Xu is an undergraduate at UW, majoring in Informatics and Psychology. She is focusing on Data Science and combines information technology and psychology to leverage DEI and support minority groups.