SIGAI Annual Report: July 1 2020 – June 30 2021

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Larry Medsker (appointed; ACM SIGAI Public Policy Officer)
Todd Neller (appointed; ACM SIGAI Education Activities Officer)
Iolanda Leite (appointed; ACM SIGAI Newsletter Editor-in-Chief)
Anuj Karpatne (appointed; ACM SIGAI Newsletter Editor-in-Chief)
Alan Tsang (appointed; ACM SIGAI Information Officer)
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Introduction

We have continued adjusting to a "new normal" in the Covid era. In addition to the significant socio-economic challenges of the pandemic, for us as a scientific organization, we continue to grapple with a world with few, if any, in-person conferences for a second year in a row, and continued virtual interactions for the community. We are, however, proud of what we have been able to accomplish in the past year. As part of transparent communication with our membership, we share here the annual report that we provide to ACM each summer. You may notice a slight change in format this year, to focus on areas that ACM is particularly interested in hearing from us about. Also note that we include the report without modifications, so the information is a few months old!

Health and Viability

The membership and financial numbers for SIGAI continue to be strong even in the face of the COVID-19 pandemic. We have also been able to maintain a robust program of conference activity, detailed below, including bringing new sponsored conferences (of particular note, AIES, IVA and EAAMO) into the fold in recent years, and continue the trajectory we began a few years ago of expanding our activity in the space of awards, student funding, and special projects funding. We have also supported policy activities and AI outreach, and increased our joint activities with other major organizations, including AAAI, IJCAI, and INFORMS. We provide more details on all of these areas below.

Diversity, Equity, and Inclusion

SIGAI emphasizes the importance of diversity, equity, and inclusion in all our activities. For many years, we have especially supported students from underrepresented groups in conference attendance through programs like doctoral consortia and student travel grants. In recent years, the centrality of AI and machine learning in society has increased concerns about how algorithmic decision-making, fueled by the capabilities of AI, could reinforce inequities and create injustices in society. SIGAI has responded with strong support of two new conferences in this area, AIES (AI, Ethics, and Society), co-sponsored with AAAI, and EAAMO (Equity and Access in Algorithms, Mechanisms, and Optimization, starting in 2021), co-sponsored with SIGecom, which grew out of the Mechanism Design for Social Good workshop series that SIGAI has been supporting for the past few years. These are both wonderful venues for interdisciplinary work in the area, and they also attract a much more diverse set of participants than most computer science conferences or groups. Our special projects funding also prioritizes outreach to communities that are underrepresented in computing, both within and outside the US. Finally we are actively recruiting a DEI focused appointed officer to work specifically on expanding our portfolio of DEI activities.

Awards

SIGAI presents three 3 major awards annually, two of which are relatively new.

The ACM SIGAI Autonomous Agents Research Award is presented for excellence in research in the area of autonomous agents. The recipient is invited to give a talk at the International Conference on Autonomous Agents and Multiagent Systems (AAMAS). The 2021 ACM SIGAI Autonomous Agents Research Award was presented (virtually) at AAMAS 2021 in London, United Kingdom to Professor Vincent Conitzer, the Distinguished University Professor of New Technologies and Professor of Computer Science, Professor of Economics, and Professor of Philosophy at Duke University, as well as Head of Technical AI Engagement at the Institute for Ethics in AI, and Professor of Computer Science and Philosophy, at the University of Oxford. Prof. Conitzer's highly cited work in multi-agent systems spans interdisciplinary areas in game theory, social choice, and economics and includes foundational contributions to the field of computational social choice, helped to define the field of automated mechanism design, and provided complexity results on Nash equilibrium as well as leader-follower games.

ACM SIGAI also sponsors the ACM SIGAI Industry Award for Excellence in AI , an annual award which is given to an individual or team in industry who created a fielded AI application in recent years that demonstrates the power of AI techniques via a combination of the following features: novelty of application area, novelty and technical excellence of the approach, importance of AI techniques for the approach and actual and predicted societal impact of the application. Due to the pandemic there was no award made in 2020. It was recently announced that the winner of the 2021 award is DrAid, an intelligent assistant for radiologists developed by VinBrain, a subsidiary of Vingroup in Vietnam. The award will be presented at the International Joint Conference on Artificial Intelligence (IJCAI) in August 2021, through an agreement with the IJCAI Trustees.

ACM SIGAI sponsors, jointly with AAAI, the AAAI/ACM SIGAI Doctoral Dissertation Award to recognize and encourage superior research and writing by doctoral candidates in AI. This annual award is presented at the AAAI Conference on AI in the form of a certificate and is accompanied by the option to present the dissertation at the AAAI conference as well as to submit a six page summary to both the AAAI proceedings and the ACM SIGAI newsletter. The winner of the 2019 AAAI/ACM SIGAI Dissertation Award, Jiajun Wu of the Massachusetts Institute of Technology, for his work entitled Learning to See the Physical World. Two runners-Up were also honored: Aishwarya Agrawal of the Georgia Institute of Technology for Visual Question Answering and Beyond, and Li Dong of the University of Edinburgh for Learning Natural Language Interfaces with Neural Models. All winners were honored during AAAI-21 in February.

Significant Papers

Notable papers appearing in conferences sponsored and in-cooperation with ACM SIGAI include:

Alves-Oliveira, P., Arriaga, P., Paiva, A., & Hoffman, G. (2021). Children as robot designers. *Proceedings of the 2021 ACM/IEEEInternational Conference on Human-Robot Interaction*, 399–408. **Best Design Paper HRI 2021**

Gillet, S., Cumbal, R., Pereira, A., Lopes, J., Engwall, O., & Leite, I. (2021). Robotgaze can mediate participation imbalance ingroups with different skill levels. *Proceedings of the 2021 ACM/IEEE International Conference on Human-Robot Interaction*, 303–311. **Best User Study Paper, HRI 2021**

Das, D., Banerjee, S., & Chernova, S. (2021). Explainable AI for robot failures: Generating explanations that improve user assistance in fault recovery. *Proceedings of the 2021 ACM/IEEE International Conference on Human-Robot Interaction*, 351–360. **Best Technical Advance Paper, HRI 2021**

Ullman, D., Aladia, S., & Malle, B. F. (2021). Challenges and opportunities for replication science in HRI: A case study in human-robot trust. *Proceedings of the 2021 ACM/IEEE International Conference on Human-Robot Interaction*, 110–118. **Best Theory and Methods Paper, HRI 2021**

Subramonyam, H., Seifert, C., & Adar, E. (2021). ProtoAI: Model-informed prototyp-

ing for AI-powered interfaces. *26th International Conference on Intelligent User Interfaces*, 48–58. **Best Paper, IUI 2021**

Guo, W., & Caliskan, A. (2021). Detecting emergent intersectional biases: Contextualized word embeddings contain a distribution of human-like biases. *Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society*, 122–133.

Perrone, V., Donini, M., Zafar, M. B., Schmucker, R., Kenthapadi, K., & Archambeau, C. (2021). *Fair Bayesian Optimization. Proceedings of the 2021 AAAI/ACM Conference on AI, Ethics, and Society*, 854–863.

Choudhury, S., Gupta, J. K., Morales, P., & Kochenderfer, M. J. (2021). Scalable any-time planning for multi-agent mdps. *Proceedings of the 20th International Conference on Autonomous Agents and Multi Agent Systems*, 341–349. **Best Paper, AAMAS 2021**

Predhumeau, M., Mancheva, L., Dugdale, J., & Spalanzani, A. (2021). An agent-based model to predict pedestrians trajectories with an autonomous vehicle in shared spaces. *Proceedings of the 20th International Conference on Autonomous Agents and Multi Agent Systems*, 1010–1018. **Best Student Paper, AAMAS 2021**

Shinde, A., Doshi, P., & Setayeshfar, O. (2021). Cyber attack intent recognition and active deception using factored interactive POMDPs. *Proceedings of the 20th International Conference on Autonomous Agents and Multi Agent Systems*, 1200–1208. **Best Application Paper, AAMAS 2021**

Liu, Z., Xia, X., Yan, M., & Li, S. (2020). Automating just-in-time comment updating. *Proceedings of the 35th IEEE/ACM International Conference on Automated Software Engineering*, 585–597. **ACM SIGSOFT Distinguished Paper, ASE 2020**

Lee, S., Lee, H., & Ryu, S. (2020). Broadening horizons of multilingual static analysis: Semantic summary extraction from C code for JNI program analysis. *Proceedings of the 35th IEEE/ACM International Conference on Automated Software Engineering*, 127–137. **ACM SIGSOFT Distinguished Paper, ASE 2020**

Gerten, M. C., Lathrop, J. I., Cohen, M. B., & Klinge, T. H. (2020). ChemTest: An automated software testing framework for an emerging paradigm. *Proceedings of the 35th IEEE/ACM International Conference on Automated Software Engineering*, 548–560. **ACM SIGSOFT Distinguished Paper, ASE 2020**

Pham, H. V., Qian, S., Wang, J., Lutellier,T., Rosenthal, J., Tan, L., Yu, Y., & Nagappan, N. (2020). Problems and opportunities in training deep learning software systems: Ananalysis of variance. *Proceedings of the 35th IEEE/ACM International Conference on Automated Software Engineering*, 771–783. **ACM SIGSOFT Distinguished Paper, ASE 2020**

Tsigkanos, C., Li, N., Jin, Z., Hu, Z., & Ghezzi, C. (2020). Scalable multiple-view analysis of reactive systems via bidirectional model transformations. *Proceedings of the 35th IEEE/ACM International Conference on Automated Software Engineering*, 993–1003. **ACM SIGSOFT Distinguished Paper, ASE 2020**

Feng, Y., Torlak, E., & Bodik, R. (2020). Summary-based symbolic evaluation for smart contracts. *Proceedings of the 35th IEEE/ACM International Conference on Automated Software Engineering*, 1141–1152. **ACM SIGSOFT Distinguished Paper, ASE 2020**

Yin, L., & Filkov, V. (2020). Team discussions and dynamics during DevOps tool adoptions in OSS projects. *Proceedings of the 35th IEEE/ACM International Conference on Automated Software Engineering*, 697–708. **ACM SIGSOFT Distinguished Paper, ASE 2020**

Conference Activity

SIGAI's conference activity is overseen by the EC and especially by our conference coordination officer, Louise Dennis. Our meetings have continued to be impacted by COVID-19. However we are gradually beginning to see events move towards hybrid modes of delivery and away from fully online only events. However, even so, we expect to continue to support online events for some time to come.

ACM SIGAI sponsored or co-sponsored the following conferences in the last year:

- IVA 2020: International Conference on Intelligent Virtual Agents

- CSCS 2020: Computer Science in Cars Symposium
- ASE 2020: International Conference on Automated Software Engineering
- WI 2020: International Conference on Web Intelligence
- KCAP 2021: International Conference on Knowledge Capture
- IUI 2021: Annual Conference on Intelligent User Interfaces
- AIES 2021: Conference on AI, Ethics and Society
- HRI 2021: International Conference on Human-Robot Interaction

and it will sponsor at least the following conferences coming up in 2021:

EAAMO 2021: Conference on Equity and Access in Algorithms, Mechanisms, and Optimization, IVA 2021, ASE 2021, CSCS 2021

ACM SIGAI also approved the following in-cooperation requests from events covering a wide thematic and geographical range across the international AI community:

- AIVR 2020 and 2021: Artificial Intelligence and Virtual Reality
- AAMAS 2021 and 2022: International Conference on Autonomous Agents and Multiagent Systems
- FDG 2021: International Conference on the Foundations of Digital Games
- ICEIS 2021: International Conference on Enterprise Information Systems.
- IMPROVE 2021: International Conference on Image Processing and Vision Engineering
- ICINO 2021: International Conference on Informatics in Control, Automation and Robotics
- ICAIL 2021: International Conference on AI and Law
- ICIKS 2021: International Conference on Information and Knowledge Systems
- AIMLSystems 2021: International Conference on AI-ML-Systems
- IC3K 2021: International Joint Conference on Knowledge Discovery, Knowledge Engineering and Knowledge Management
- IJCKG 2021: International Joint Conference on Knowledge Graphs
- ICAART 2022: International Conference on Agents and Artificial Intelligence

Special Projects and Non-Conference Programs

Newsletter

AI Matters, the ACM SIGAI newsletter is distributed via the ACM SIGAI mailing list but also openly available on the ACM SIGAI website (at sigai.acm.org/aimatters/). Co-editors Iolanda Leite and Anuj Karpatne have beenAI Matters features articles of general interest to the AI community. ACM SIGAI publishes four issues of its newsletter AI Matters per year. In 2021 we welcomed Dilini Samarasinghe, Assistant Conference Coordination Officer for ACM SIGAI, identified through the ACM Future of Computing Academy, to our regular editorial team. She is now editing the events column together with Louise Dennis. The recurring columns in AI matters have included AI Interviews (with interesting people from academia, industry, and government), AI Amusements (including AI humor, crossword puzzles, and games), AI Education, AI Policy Issues, AI Events (which includes conference announcements and reports), AI Dissertation Abstracts and News from AI Groups and Organizations, and AI Latest Research Trends (where we invite recent recipients of competitive grants to write about their latest research projects). In addition to our regular columns, other featured articles this year included, for example, reports from SIGAI sponsored events such as the Fourth Workshop on Mechanism Design for Social Good and the "Decoding AI" event targeting high school students and the general public (both published in Volume 7, Issue 1). AI Matters is also publishing extended abstracts of winners and runner ups from the AAAI/SIGAI Dissertation Award.

Activities Fund

Starting in 2019 ACM SIGAI has started the annual SIGAI Activities Fund. This fund seeks to promote outreach in all aspects of AI. Activities must contain a strong outreach component to either students, researchers, or prac-

titioners not working on AI technologies or to the public in general. The purpose is to promote a better understanding of current AI technologies, including their strengths and limitations, as well as their promise for the future. Examples of fundable activities include (but are not limited to) AI technology exhibits or exhibitions, holding meetings with panels on AI technology (including on AI ethics) with expert speakers, creating podcasts or short films on AI technologies that are accessible to the public, and holding AI programming competitions. ACM SIGAI looks for evidence that the information presented by the activity will be of high quality, accurate, unbiased (for example, not influenced by company interests), and at the right level for the intended audience.

In the 2020-2021 cycle we accepted two projects:

- **Try AI: Micro-Internship Edition** from Elizabeth Bondi and Alexis Stokes to develop a micro-internship program in which college students may participate in research with a Harvard researcher (PhD student, postdoc, and/or faculty) in the field of artificial intelligence (AI) for 1 week.
- **The 4th Workshop on Mechanism Design for Social Good (MD4SG '20)** from Francisco Javier Marmolejo Cossio and Faidra Monachou which was held online and sought to highlight work where techniques from algorithms, optimization, and mechanism design, along with insights from other disciplines, have the potential to improve access to opportunity for historically underserved and marginalized communities.

Writeups of all funded activities are published in AI Matters.

Website and Social Media

With the help of freelancer Andrea Alessandri, we are transitioning the SIGAI website to a more modern look and feel using WordPress. The new website will present a more standardized and professional appearance and more clearly lay out ways for visitors to interact with SIGAI as well as improved accessibility. Moreover, the new platform greatly streamlines the process for updating the website, which will help keep content up to date. We have also recruited a new dedicated officer, Matt Luckcuck, to manage SIGAI's social media accounts with the aim of increasing the "naturalistic" usage of the account and planning the information and publicity pipeline.

Public Policy Activities

ACM SIGAI promotes the discussion of policies related to AI through posts in the AI Matters Blog and the Newsletter Public Policy column. The Public Policy Officer, Dr. Larry Medsker, helps SIGAI identify external groups with common interests in AI public policy, encourages ACM SIGAI members to partner in policy initiatives with these organizations, disseminates public policy ideas to the ACM SIGAI membership with the goal of ensuring that every technologist is educated, trained and empowered to prioritize policy and ethical considerations in the design and development of intelligent systems. As a group, we study how organizations collect and analyze data and whether these practices are consistent with recommendations by ACM AI policy groups. Our mission is to share AI policy ideas and information among SIGAI members and beyond.

Through the Public Policy officer, ACM SIGAI participates in the work of the ACM US Technology Policy Committee. ACM USTPC addresses US public policy issues related to computing and information technology and regularly educates and informs US Congress, the US Administration and the US courts about significant developments in the computing field and how those developments affect public policy. For example, in the 2020-21 period the ACM SIGAI Public Policy officer continued activities related to SIGAI policy efforts, such as work with the ACM USTPC team that is writing a piece for Nature Comment on the ethics and policy implications of research on machine learning and face recognition. The Public Policy Officer is also on the ACM USTPC team overseeing the management and production of ACM TechBriefs. In other 2020-21 activities related to ACM Public Policy, he became Co-Editor-in-Chief of the new journal AI and Ethics, and he was the moderator of a panel on AI and Facial Recognition at the ALGOL 2021 annual conference.

Education Activities

Our education activities have continued at a strong pace under the guidance of our Education Activities Officer, Todd Neller. It was another good year for expanding our Model AI Assignment archive (http://modelai.gettysburg.edu/). Our EAAI-2021 track was again successful, attracting 6 new accepted, peer-reviewed projects into our archive which were presented virtually at EAAI-2021 on February 6 and 7 (https://pages.mtu.edu/~lebrown/eaai/index.html).

The EAAI-2021 Mentored Undergraduate Research Challenge (MURC), Gin Rummy (http://cs.gettysburg.edu/~tneller/games/ginrummy/eaai/), engaged 50 faculty mentors, industry mentors, and students who formed 14 teams which resulted in 14 Gin Rummy AI submissions, 14 paper submissions, and 13 papers accepted through peer review. This represents a new record participation for an EAAI MURC.

At EAAI-2021, we announced our latest mentored undergraduate research challenge for EAAI-2022: AI-Assisted Game Design (http://cs.gettysburg.edu/~tneller/games/aiagd/index.html). Also, for the first time, we (Todd Neller and Rick Freedman) are forming a new committee structure for the MURC, with a two-year, over-lapping co-chair position that is expected to rotate among MURC program committee members. This should ensure both diverse problem-domains and a strong, coordinated effort to supply ready-made, supported research challenges to faculty and undergraduates who would benefit.

Job Fair

AAAI and ACM SIGAI have partnered to run the popular AAAI/ACM SIGAI Job Fair for the last seven years. In lockstep with the growth of AAAI and the growth of the greater artificial intelligence and machine learning (AI/ML) community, our once-small job fair also grew. At AAAI-20, thirty-eight companies and universities formally attended, typically with a booth, team of recruiters, swag, and other representatives, increasing from twenty-six companies during the job fair's previous run in 2019, and twenty-one companies in the year prior to that. In 2021, Michael Albert (U Virginia), John Dickerson (Maryland), and Matthew Taylor (Alberta) co-ran the job fair, which was virtual-only for the first time due to COVID. Roughly fifteen companies and other organizations attended, a drop from the previous year(s); this, as with many things, was almost certainly due to the forced move to virtual due to the pandemic. Still, as shown on our dedicated domain https://aaaijobfair.com/ for the job fair, we were able to connect interested job seekers with internships and jobs, and participating firms were able to present themselves, albeit virtually. In 2022, Michael Albert (U Virginia) and John Dickerson (Maryland) will be co-running the job fair. We intend to be more proactive about virtual-only participation and will likely leverage Gather.town to facilitate live (virtual) in-person meetings between job seekers and representatives from firms, which should hopefully more closely mimic the traditional, in-person job fair.

AI-OR Workshop Series

SIGAI, joint with the CCC (Computing Community Consortium) and INFORMS, is co-organizing three agenda setting workshops to explore synergy and opportunity at the nexus of Artificial Intelligence and Operations Research. Each workshop will consist of a set of brief talks designed to inform and generate discussion about opportunities that each community will find novel and exciting. On September 23 and 24, 2021, we will jointly run the first of three workshops. Each workshop will have about 40 invited participants from across AI and OR. The organizing committee includes members of the AI, ML, and OR communities: Sanmay Das (GMU), John Dickerson (Maryland), Sven Koenig (USC), Ramayya Krishnan (CMU), Radhika Kulkarni (Cornell), Pascal Van Hentenryck (Georgia Tech), and Phebe Vayanos (USC). We have many speakers confirmed for the first workshop (e.g., Stephen Wright, Andrea Lodi, Katia Sycara, Satinder Singh, David Simchi-Levi, Ranga Nuggehalli, Robert Hampshire, Subbarao Kambhampati, Aaron Roth, Milind Tambe, Cynthia Rudin, Margret Bjarnadottir, and likely others), and are happy to support a cross-cutting agenda that spans multiple related disciplines. Following this first workshop,

we will co-organize two additional workshops likely in Nov/Dec of 2021 and Jan/Feb of 2022; the foci of those workshops will be set at this coming first workshop, but will likely include heavier overlap with policymakers and with practitioners.

Key Issues

Like every SIG, we will have to deal with the question of what conferences will look like going forward, and how to support students and others in accessing and getting the benefits of conferences in whatever future formats they take place. SIGAI has been dealing with the issue, from before the pandemic, that we do not have a single conference that most of our members regularly attend. Therefore, there isn't a centralized meeting place for an annual business meeting, or the ability to build a sense of SIGAI identity in the membership through a conference. We hope that the solutions people are working on necessitated by the pandemic may help us in resolving this issue as well.

References