



2021 Election for Board Director

Candidate

Sabrina Pei-Yun Hsueh

Professional Title And Affiliation

Health AI Entrepreneur, Bayesian Health Inc.

Personal Statement

Excellence is never an accident. It is the result of high intention, sincere effort, intelligent direction, skillful execution, and the vision to see obstacles as opportunities. As a dedicated enabler with a history of contributions to the integration of data science and the science of care in various healthcare settings, I know from first-hand experience that innovation is difficult and would require strong leadership and interdisciplinary collaboration to foster concerted, constructive actions. Therefore, I truly believe in the value of AMIA in leading the formation of a visionary, equitable health informatics roadmap, and I would like to be part of the force to help bring in new perspectives from working with innovators and practitioners on the frontline and grow our beloved professional community to the next level.

During the turbulent yet transformative time marked by a global pandemic, we have observed an unprecedented rate of changes and the shift of healthcare landscape. Many new players are taking up increasingly important roles in the ecosystem to make impacts on the Quadruple Aims. I look forward to continuing my efforts in facilitating the AMIA community to establish interdisciplinary industrial partnership for patient-centered care, promoting diverse and equitable workforce, and optimizing workflows to support the delivery of scientific real-world evidence within healthcare systems. My strong personal commitment and dedication to connecting this professional community with the community of innovators and entrepreneurs through my career of industrial solution development and real-world evidence delivery would be unique here to help the organization realize the potential of AMIA's influence in this ever-changing healthcare landscape.

Here are a few more examples. In the past few years, I have dedicated the efforts to lead the AMIA Consumer and Pervasive Health Informatics Work Group and help the Women in AMIA community to grow. During my term as the workgroup chair, we have been tackled emerging issues such as patient-generated health data, citizen science, and precision medicine through collective initiatives and a community building process. We have organized a series of panels and workshops to identify gaps and gather requirements from domain experts in multiple disciplines to understand how we can better utilize the emerging technologies in the care flow. I have also served as a practitioner board member for Association of Computing Machinery (ACM) to help ACM understand the impactful changes that have been brought by the health

informatics community. Besides the positions I hold directly, I also served as a mentor for many others and helped promoting a diverse and equitable workforce wherever appropriate.

Most recently, I helped the community collectively publish books in the areas of Machine Learning in Medicine and Healthcare and Personal Health Informatics. Through the books, we compiled a collection of high-quality scholarly work that seeks to provide clarity, consistency, and reproducibility, with a shared view of the latest evolution in Health AI and Consumer Health Informatics and its relevance to precision medicine and healthcare applications and system design. My fresh perspectives in emerging technologies helped shape the book content and offer a snapshot of these emerging fields, supported by the methodological, practical, and ethical perspectives from researchers and practitioners in the field. My previous role as a researcher and the current role as a health AI entrepreneur helped me provide pragmatic insights for practitioners in designing, implementing, and evaluating their insights generation tools in the care flow.

If elected to serve on the Board of Directors for AMIA, I would be honored to continue my efforts in helping students and health professionals in all clinical disciplines and informaticians in biomedical and health informatics to learn more about the emerging trends and making impacts collectively. For the emerging issues that still need more discussions to find the path going forward, I would help AMIA to serve as a perfect venue to understand this complex, multi-disciplinary domain, carry out necessary debates, and build consensus towards the priorities as a community. When needed, I could also help involve the global community such as IMIA and EFMI whom I worked closely earlier. AMIA, in my mind, has always been the greatest venue to shape and present the community's point of view towards policy recommendations and information governance initiatives to a greater global medical informatics community. I look forward to working with this community in shaping our POV, strengthen the visibility and impacts, and provide opportunities to such evidence generation and application opportunities.

For healthcare professionals and researchers who keep abreast of the emerging technologies in the domain of community and home-based care, the recent shift of healthcare landscape towards the consumer side and the opportunities to reimagine healthcare are simply amazing.

Informatics Interests

With the increasing maturity of the process of generating health informatics insights in various care settings, the integration of insights generation tools within everyday healthcare practice has become a key challenge to pave the last mile for the insights to be useful. FDA has published action plans for regulating Software as a Medical Device and approved more than 160 medical AI products. However, the challenge just began given the emergence of evidence on the potential bias and the lack of efficacy for the leading tools to deliver improved outcomes. Due to the sensitivity of health AI tools in producing unintended consequences such as incorrect diagnoses, unnecessary treatments, and racial disparities, there is also a growing concern on how to produce safe, reliable, and trustworthy AI for adaptive clinical decision support systems.

On the one hand, the industry needs to collectively work out a set of principles for evaluating the success of integration, identifying active experiments for determining where to go next, as well as establishing a collaborative checklist of specific to-dos for integrating health AI/ML tools into care pathways and healthcare processes. Only when we work out such industrial standards would we be able to successfully and safely apply the insights to deliver its promise on improving patient outcomes, cutting medical waste, and reducing provider burnout.

On the other hand, our health informatics community needs to help the systems incorporate patient-centered approaches such that the unintended consequences and the full picture of insights could be captured through a deeper understanding of patient social-behavioral phenotypes. While the precision medicine framework has included targeted approaches based on the recognition of driver mutations from patient genetic data, this framework can be further extended to identify driver social-behavioral phenotypes and subsequently test interventions based on those phenotypes. The developed patient-centered precision health framework would open new opportunities for more targeted care flows, ranging from health/wellness assessment, disease interception, personalized patient engagement and education tooling, to context-sensitive intervention.

To fulfill the potential of applying health informatics to ensure patient safety in adaptive clinical decision support systems and to develop such a patient-centered framework, my personal informatics interest therefore lies on the operationalization of best-in-class industrial principles and checklist. This is based on many years of experience working with the frontline providers to embed actionable insights in clinical workflows, in addition to facilitating better understanding of individual patients and warrant sustainable adoption from its ecosystem to improve patient's outcomes without increasing burden.

AMIA Engagement and Participation

FAMIA 2020 Fellow of American Medical Informatics Association

- AMIA Women in AMIA Steering Committee (2021-present)
- Co-Chair, AMIA Women in AMIA Awards and Leadership Subcommittee (2021-present) and committee member since 2018
- Past Chair of AMIA Working Group – Consumer and Pervasive Healthcare Informatics (2021-present)
- Chair-Elect and Chair of AMIA Working Group – Consumer and Pervasive Healthcare Informatics (2018-2020)
- Women in AMIA Leadership Program (2018-2019)
- AMIA-Society of Behavioral Medicine Liaison (2017-2018)
- AMIA Annual Symposium Distinguished Paper Award Winner (2018)
- Editor, JAMIA OPEN Special issue: Precision Medicine in the Patient-Centered Era (2018-2019)
- AMIA Annual Symposium Scientific Program Committee SPC (2017)
- AMIA Meeting Leadership:

- o AMIA Annual Symposium Panel Chair, Health AI Bias and Adoption (2021) and Workshop Chair, Actionable Insight for Transitions of Care (2021)
- o AMIA Clinical Informatics Conference Workshop Chair, Real-time Insights for Care Delivery (2021)
- o AMIA Annual Symposium Workshop Chair, Patients as Equal Partners in the Design Process (2020) and Panel Chair, Novel Care Delivery Model (2020)
- o AMIA Annual Symposium Workshop Invited Speaker, Patient Reported Outcome (2019)
- o AMIA Workshop Chair: Citizen Science & Patient Voice in Research: An Informatics Perspective (2018)
- o AMIA Annual Symposium Panel Chair, Transforming Patient-Generated Health Data for Wellness and Biomedical Research (2016); Workshop, Patient-Generated Health Data in Action (2016).

Participation in other organizations

Board Member, Association of Computing Machinery (ACM) Practitioners (2018-present)

- United Nations AI for Good: Healthcare (AI4H) Committee (2019-present)
- IEEE P7008 Standard Committee Voting Member (since 2018)
- IEEE Senior Member
- Founding Chair, ACM KDD Applied Data Science in Healthcare Workshop (2018-2021)
- IMIA (International Medical Informatics Association) General Assembly Voting Representative (2017, 2019)
- Steering Committee Member & Ex-Treasurer, Emerging Information and Technology Association (2017-present)
- Board Director, Chinese Institute of Engineers (2015-2019); Biomedicine Division Leader, SATEC (2018)
- EFMI STC Program Committee (2017)
- IMIA Working Group, Wearable Sensor (2017)
- Editor, Sensor: Special Issue on Data Analytics and Applications for Wearable Sensors in Healthcare (2018-2019)
- Society of Behavioral Medicine Member and Behavioral Informatics and Technology SIG (2017-2019)
- ISPOR Professional Society for Health Economics and Outcomes Research Member (2021)
- Other meeting leadership:
 - o SBM 2019 Panel Chair, Citizen Science & Patient Voice in Research (2019)
 - o IMIA MEDINFO Panel Chair, New Care Delivery Model Using E-enabled Patient-Provider Communication (2019)
 - o IEEE ICHI Workshop Chair, Chronic Disease Management in the AI Era (2019)
 - o SBM Panel, Citizen Science & Patient Voice in Research (2019)
 - o ACM KDD Workshop Chair, Machine Learning for Medicine and Healthcare (2018)
 - o IMIA MEDINFO Workshop Chair: From Data Modeling to Knowledge Learning Symbiosis (2017); MEDINFO Panel Chair: Integrating Science of Data with Science of Care for Interpreting Patient Need (2017)

- o MIE/HEC Workshop Chair, Interdisciplinary Approaches for Using Visualization for Wellness Decision Support (2016); Workshop Chair, A Socio-Technical Approach to Securing Health Informatics (2016)
- o IMIA MEDINFO Workshop Chair, Effective Patient Adherence Management (2015)
- o MIE Workshop Chair, Patient Adherence with Engaging Enabling Technologies (2015)
- o MIE Workshop Chair, Gap Analysis for Insights with Patient-Controlled Devices (2014)
- o IMIA MEDINFO Panel Chair, Personalized Healthcare and Adherence (2013)

Education and Experience

PhD in Informatics, University of Edinburgh

Master of information management & systems, University of California, Berkeley

Bachelor, Computer Science and Information Engineering, National Taiwan University

Recent Publications

- C. Petersen, R. Austin, P.S. Hsueh, H. Campos, E. Hekler, K. Katherine, A. Pho, L. Salmi, R. Valdez, A. Solomonides, A.E. Chung, U. Backonja. Citizen Science to Further Precision Medicine: From Vision to Implementation. To appear in JAMIA OPEN Special Issue.
- P.S. Hsueh, S. Das, C. Maduri, K. Kelly. Learning to Personalize from Practice: A Real World Evidence Approach of Care Plan Personalization based on Differential Patient Behavioral Responses in Care Management Records. In Proceedings of AMIA 2018 (Distinguished Paper Award).
- Sun, P.S. Hsueh, S. Ballen, M. Ball. Modeling the Personas of Primary Care Communication Modality Usage: Experiences from the R-Health Direct Primary Care Model. MEDINFO 2019.
- Y.K. Cheung, P.S. Hsueh, I. Ensari, J. Willey, K. Diaz. Quantile Coarsening Analysis (QCA): A Practical Method for Dimension Reduction and Cluster Analysis of High-volume Data from Wearable Activity Trackers. Sensors Journal: Special Issue on Data Analytics for Wearables in Healthcare 2018.
- P.S. Hsueh, S. Das, M. Knowledge-Guided Behavioral Phenotyping from National Health Examination and Nutrition Survey and Device Data. SBM 2019.
- X. Hu, P.S. Hsueh, M. Qian, C-H Chen, K.M. Diaz, Y-K Cheung. (2017). A First Step Towards Behavioral Coaching for Managing Stress: A Case Study on Optimal Policy Estimation with Multi-stage Threshold Q-learning. AMIA 2017.
- Z. Yin, M. Bradley, J. Warner, P. Hsueh, C. Chen. (2017). The Power of the Patient Voice: Learning Indicators of Hormonal Therapy Adherence from an Online Breast Cancer Forum. ACM ICWSM 2017.
- Y.K. Cheung, P.S. Hsueh, M. Qian, S. Yoon, L. Meli, K.M. Diaz, J.E. Schwartz, I.M. Kronish, K.W. Davidson. Are nomothetic or idiographic approaches superior in predicting daily exercise behaviors? Analyzing N-of-1 mHealth data, Methods of Information in Medicine, 56(5).
- X. Hu, P.S. Hsueh, C.Chen, M. Qian, F.E. Parsons, I. Ensari, K. Daz, Y.K Cheung. An interpretable health behavioral policy for mobile device users. IBM Journal of Research and Development, vol 62(1), Jan 2018.
- P.S. Hsueh. F. Martin-Sanchez, K. Kim, S. Peterson, S. Dey, Y-K Cheung, T. Wetter. (2017). Added Value from Secondary Use of Person Generated Health Data in Consumer Health

Informatics, IMIA Yearbook of Medical Informatics 26(1), 2017: 160-171.

<https://doi.org/10.15265/IY-2017-009>

- P.S. Hsueh, S. Das, S. Dey, T. Wetter. Making sense of Patient Generated Health Data (PGHD) with better interpretability: The transition from "more" to "better", MEDINFO 2017. Studies in Health Technology and Informatics: MEDINFO 2017: Precision Healthcare through Informatics Vol 245, p.113-117.
- Lai, A., P.S. Hsueh, Y. Choi, R. Austin. (2017). 2017 IMIA Yearbook of Medical Informatics: Consumer Health Informatics Survey: Present and Future Trends in Consumer Health Informatics and Patient Generated Health Data Patient-generated Health Data for Consumer Health Informatics. Yearbook of Medical Informatics, 26(1), 152–159.
- Hsueh, P.S., H. Chang, S. Ramakrishnan. (2015). Next-Generation Wellness and Prevention Care: From Supporting Technology for Personalization to Ecosystem Formation, Book chapter on Healthcare information Management, 4th Edition, Springer Publishing, 2015.
- Hsueh, P.S. (Chair), M. Ball, M. Marschollek, F. J. Martin Sanchez, C. Patrovian, V. Patel. (2015). Addressing Patient Adherence Issues by Engaging Enabling Technologies. MIE 2015 Workshop. Hsueh, P.S. (Chair), M. Ball, M. Marschollek, F. J. Martin Sanchez, C. Patrovian, V. Patel. (2015). Addressing Patient Adherence Issues by Engaging Enabling Technologies. MIE 2015 Workshop.

Honors and Awards

2020 Elected as FAMIA 2020 Fellow of American Medical Informatics Association

2018 Elected as IBM Academy of Technology Member

2018 AMIA 2018 Distinguished Paper Award

2015-2019 Co-Chair, Health Informatics Professional Interest Community

2018 IBM Innovation Patent 7th Plateau (marking the 28th patents filed)

2017 IBM Research Scientific Achievement Award

2017 IBM Manager Choice Award

2016 IBM High-value patent

2016 IBM Eminence and Excellence Award & Cognitive-Build Challenge Top 4 Technology Leadership on Disruptive technology, Manger Choice Award, MicroMBA program

2014 Co-lead, IBM Global Technology Outlook Healthcare Topic & IBM Manager Choice Award

2013-2016 Board of Directors, Chinese Institute of Engineers Greater New York Chapter

2009-2013 IBM Invention Achievement Awards

2007 GOOGLE European Anita Borg Scholar

2005–2008 EU FP6 Research Scholar

Evidence of Strategic Thinking/Experience in Activities of AMIA or another non-profit or institution

Expanding the membership basis and exploring potential alliance to expand outreach and amplify impacts have always been the key drivers of success to professional communities. In my over 10 years of experience serving on the boards of various non-profit organizations, I am especially focused on bringing out concerted efforts on these key drivers, as my prior

experiences have taught me how important they are in warranting a sustainable long-term growth of the organizations.

1. One such example comes from my term serving on the Board of the Association of Computing Machinery (ACM) practitioners. In particular, I helped the organization on two main efforts: First, we started a new podcast series to outreach to practitioners and innovators who are at the intersection of computing research and practice. In each monthly episode, guests will share their experiences, the lessons they've learned, and their own visions for the future of computing. The podcast series have been shared with tens of thousands of listeners beyond the traditional membership basis of ACM.

Secondly, I co-founded and chaired a new series of workshops in the key ACM KDD conference since 2018 to stimulate workshop discussions for the application of AI in industrial solutions. Each year we nailed down on the emerging topics and assembled an all-star team of biomedicine experts around the emerging topics for a focused discussion. We are currently editing a new book in Machine Learning for Medicine and Healthcare based on the outcomes of the workshop.

We have also helped locate funding for best paper awards so as to encourage more students to work in this area and help them publish in reputable journals. This helped the organization to further expand its influence in the interdisciplinary areas where collaboration is the key in practice. Most recently, I also served as the group leader in the biomedicine sector to further nurture the discussion of real-world evidence use for precision health in the pharma industry.

Last but not the least, many other conferences this year during COVID pandemic have started exploring the non-traditional format to turn this new format into an opportunity for their expansion of influence. We have helped ACM KDD to start a workshop-based registration process this year during the pandemic in order for more people who do not usually attend KDD have a chance to attend.

2. In our own AMIA, my reputation as an emerging leader also helped me get elected as the Chair-Elect of Consumer and Pervasive Health Informatics work group. During my term, I am proud of our concerted efforts to host events around the topic of patient-generated health data in three consecutive years and has been pivoted to include patient and caregiver advocates in the roundtable discussion. This has led to a series of forums: AMIA 2015 panel on PGHD, AMIA 2017 Policy Invitational, AMIA 2018 Citizen Science Workshop and ePRO Pre-Symposium, AMIA 2019 ePRO-Citizen Science joint pre-symposium, and AMIA 2020 Novel care delivery model panel and Pre-symposium on Patients as Equal Partners. The series helped bring interdisciplinary researchers and industry leaders together to further the agenda of applying consumer health informatics in practice. We are also currently editing a new book on Personal Health Informatics to summarize the results of out the series of discussions and presented the status quo of this emerging field.

I am also proud of our efforts to host the Collaborative Citizen Science workshop in 2017 and 2018 with the Society of Behavioral Medicine in their annual symposiums. In this emerging

field, we have witnessed tremendous progress in the use cases of incorporating electronic patient-reported outcomes (ePROs) and Citizen Science-inspired approaches in the fields of health system design and biomedical informatics research. We have also taken a step further to dive into case studies (e.g., community-based research/trial protocols, patient-centered participatory design, platforms for enabling scalable evidence generation and personalized recommendation) to learn from the informaticists and considered how to bridge the gap between research and practice.

3. Most recently in AMIA CIC 2021, I have helped organize a workshop with a focus on discussing about the evaluation and the adoption issues for the successful delivery of real-time insights in clinical flows. As this is a topic that requires close collaboration between informaticians and health system leaders, we have brought in the industrial leaders who do not normally attend AMIA and given them a tremendous positive experience about the targeted discussion with the AMIA experts. Our efforts have paid off in the quality of the discussions and the outreach diversified out of the original membership and audience of AMIA.

Contributions to Activities that Support Diversity, Equity, and Inclusion

Promoting the workforce diversity and equity has always been one of the driving forces behind my efforts in non-profit organization work. Over the years, I have paid attention to female technologist whose contributions to be known by more and helped promote their visibility so that the younger generation can find their role models from a wider variety of examples. It is my strong belief that if no one else would, let's promote them ourselves. For example, during my term on the Board of Directors of CIE, I helped select well-qualified female candidates for the Asian American Engineers of the Year Awards and the Distinguished Scholar Award. In addition, I have served as a Google Anita Borg Scholars in Europe and was a founding member of the Grace Hopper Society during my PhD time. I have also been contributing to the Women in AMIA leadership and awards committee, Women in AMIA leadership program, IEEE Women in Engineering community, and the Society of Women Software Engineers. This year I have started serving as a co-chair of the leadership and awards committee and on the steering committee. I sincerely look forward to using this opportunity in helping amplify the message and making sure that we have a healthy and sustainable pipeline of diverse leaders.