Cynthia Pickering

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PRINCIPAL ENGINEER | CHIEF ENTERPRISE SYSTEMS ARCHITECT | STEM

Cloud Solutions • Collaboration and Productivity • Research & Innovation • IT Strategy • Director

Driven and accomplished senior technical leader with extensive experience directing collaborative teams in the semiconductor, aerospace and defense industries. Expertise in research, technology systems, solutions architecture, engineering and software development. Identify emerging technology trends and business opportunities in highly ambiguous environments and translate value add usages to architect overall solutions; partner with solution ingredient providers and developers to deliver timely and cost effective solutions. Excellent communication and leadership skills embracing a big picture philosophy to drive innovation identify strategic targets and influence key stakeholders and decision makers.

- STEM Education Research
- Collaborative & Social Computing
- Unified Collaboration & Communication
- Office Productivity including Mobile Apps
- Strategic System & Solution Architecture
- Enterprise Architecture including SaaS/Cloud
- Service-Oriented Architecture
- Distributed Processing Architectures & Systems
- Agile Methods/Problem Solving/Innovation
- User Experience Design & Usage Development
- Business Process & Systems Analysis
- Big Data/Insights & Advanced Analytics
- Artificial Intelligence (AI) & Robotics
- Industrial Automation
- Real-time Systems
- Object Oriented Analysis/Design/Programming

PROFESSIONAL EXPERIENCE

ARIZONA STATE UNIVERSITY| Scottsdale, AZ **09/2018-present**

Associate Research Director, Center for Broadening Participation in STEM, Knowledge Enterprise Development Research

Co-PI, NSF INCLUDES ALRISE Alliance

Co-PI, Work-focused Experiential Learning to Increase STEM Student Retention and Graduation at Two-year Hispanic-serving Institutions

Co-PI, Collaborative Research, Hispanic Serving Institution Advanced Technological Education Resource Hub 2.

Technical Lead and Process Architect, Evidence-based Student-centered STEM at Hispanic Serving Institutions.

SCIENCE FOUNDATION ARIZONA | Phoenix, AZ **09/2015-9/2018**

SFAz Fellow, Girls in STEM, Community College STEM Pathways

Technical Lead for SFAz Web Presence for Girls in STEM, delivering initial strategy and ongoing outreach.

Technical Lead and Process Architect for AZ STEM Network Social Communities for Community College STEM Pathways.

Technical Lead for NSF Kickstarter grant and STEM Pathways Assessment and Planning Framework

INTEL CORPORATION | Chandler, AZ **08/1991– 7/2015**

Principal Engineer (2004 – 2015)

Directed all aspects of technical leadership and oversight for the full lifecycle of domain, including collaboration, office productivity, sales and marketing IT solutions. Oversaw research, architecture definition, strategy, roadmaps and prototyping initiatives; transferred technology innovation to engineering and operations for implementation and support. Regularly published and spoke at key industry and academic conferences.

- Served as lead researcher, strategist and architect for delivering industry-leading social and integrated collaboration solutions to Intel employees, customers, partners and suppliers. Owned architecture definition, governance and delivery.
- Established R&D agenda, POC pipeline and Innovation Lab for Collaborative Computing domain with one patent and 14 peer-reviewed publications. Yielded $11M architecture reuse value and industry fellow traveler engagements yielding $6.8M Intel design wins.
- Spearheaded technology evaluation resulting in major re-platform and upgrade of internal social computing platform aligned to Intel's external offerings. Architected the solution and designed in gamification to incentivize collaborative behaviors. Result was tremendous employee adoption over the prior system and one year later there are 72K active users, 400K discussions and documents, 11M views of company news articles, 4k answered questions in knowledge forums and 4K ideas.

- Directed team of researchers and partnered with third party vendors to produce Intel patented intellectual property for Collaboration and Desktop Productivity.
- Directed team of enterprise architects to design and develop components of service-level integrated solutions for unified collaboration and communications. Worked with engineering and operations teams to implement and deliver solutions.
- Directed team of enterprise architects to design and develop components of SaaS and cloud integrated solutions for Intel sales and marketing solutions including cross system insights and analytics captured in a big data repository. Worked with engineering and operations teams to implement and deliver solutions.

Additional selected projects in partnership with Intel Business Units included:

Rotation – Business Client Perceptual Computing Architect – PC Client Group (2011 – 2012)

- In charge of Human Computer Interaction based on human senses of voice, vision, touch, and gestures.
- Developed a POC to recognized speech, capture a live meeting transcript, and translate it to foreign languages.

Enterprise Compute Continuum (2008 – 2011)

- Led User Experience team for Enterprise Compute Continuum
- Developed blended consumer business usages for a range of compute devices including smart phone, tablet, TV, and embedded computing
- Influenced product engineering to incorporate requirements for blended business and consumer features.

Additional Intel Accomplishments prior to 2004:

- **Created and drove IT Concept Cars Program** adopting automotive industry's concept car methodology. Influenced the Digital Enterprise Group's Digital Office Product Roadmap to include compelling business usages. Defined the first IT Integrated Collaboration roadmap and Service Oriented Architecture for Collaboration.
- **Provided subject matter expertise to develop User centered concepts for next generation collaboration business solutions** during IT Strategic Long Range Planning (SLRP). Influenced IT product line business plan adoption and refinement of SLRP priorities.
- **Defined 3-tier applications architecture,** led the technology development workgroup in the applications architecture department and managed several cross-functional projects that prototyped and refined architecture concepts in the areas of 3-tier, workflow and mobile/international applications.
- **Managed the workflow automation group in desktop automation and led a cross-functional team** that evaluated document management products against customer document control requirements. Consolidated group calendaring within Intel to a single solution. Defined the client architecture and worked with product management to evaluate and select products to fulfill customer requirements.
- **Maintained and enhanced object oriented factory model for the Artificial Intelligence (AI) scheduler** for semiconductor wafer fabrication. Led project to develop intelligent user interface tools for the AI scheduler and for editing the factory model.

Early Career Experience

Technical Staff – Electrical Engineering & Computer Science Department AI Group, FMC Corporate Technology

Artificial Intelligence Software – Advanced Automation Technology AI Group, Martin Marietta Denver Aerospace

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Education & Professional Development

BS Electrical Engineering, **PENNSYLVANIA STATE UNIVERSITY**

,MS Human and Social DImensions of Science and Technology, **ARIZONA STATE UNIVERSITY**

Memberships / Affiliations

ASEE • SACNAS • AAC&U • ACM SigCHI • AAAI • IEEE • ETA KAPPA NU • SWE • EIT

Volunteer Activities

VEX Robotics Club Middle School and High School Teams- 2016-17
Day @ Intel STEM Field Trip - SWE Phoenix Section
STEM Experience at IEEE International Microwave Conference
STEM Spotlight Video Calls with Middle School Classes - MCESA
Centro Latina STEM Camp
Girls and Boys Club Randolph AFB Techfest
AZ Science Center - Girls in STEM
Grace Hopper 2014 - Hopper Helper at Student Opportunity Lab and ABIE Change Panel

PUBLICATIONS

ORCID ID: *https://orcid.org/0000-0001-8148-098X*

Pickering, Fisher, Ross (2022), Socio-Technical Learning: Contextualizing Undergraduate Externships To Bridge The Digital Divide, Iadis International Journal On Computer Science And Information Systems (ISSN: 1646-3692), http://www.iadisportal.org/ijcsis/

Pickering, C., & Lopez, M., & Gonzalez, G., & Garcia, M., & Vaningen-Dunn, C., & Pinto, K. (2022, August), *Work-based Experiential Learning in IT: Career Enhancement for Underserved Students at a 2-year HSI* Paper presented at 2022 ASEE Annual Conference & Exposition, Minneapolis, MN. https://peer.asee.org/41378

Pickering, C., & Miller McNeill, L., & Lopez, M., & Rodriguez, J., & Belknap, S., & Craft, E., & Vaningen-Dunn, C. (2022, August), *Theory to Practice: Professional Development for Culturally Responsive Technician Education* Paper presented at 2022 ASEE Annual Conference & Exposition, Minneapolis, MN. https://peer.asee.org/41374

Pickering C. K., Fisher E., Ross, P. (2021, Dec), One Step at a Time: Deepening Socio-technical Learning in Undergraduate ICT Externships to Bridge the Digital Divide, 11th International Conference on Internet Technologies & Society (ITS), Virtual Conference.

Pickering, C. K., & Craft, E. L., & VanIngen-Dunn, C., & DeWitt, E., & Roberts, R. H. (2021, July), *The Road to Strengthening Two-year Hispanic-Serving Institution Participation in the NSF ATE Funding Program* Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. https://peer.asee.org/37889

Pickering, C. K., & VanIngen-Dunn, C., & Reyes, M. A. (2021, July), *Work-focused Experiential Learning to Increase STEM Student Retention and Graduation at Two-year Hispanic-serving Institutions* Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. https://peer.asee.org/38212

Pickering, C. K., & VanIngen-Dunn, C., & Grierson, A., & Gallegos, A. T. (2020, June), *Achieving Broader Impacts in STEM at 2-year Hispanic Serving Institutions* Paper presented at 2020 ASEE Virtual Annual Conference Content Access, Virtual Online . 10.18260/1-2--34087

Pickering, C. K., & Craft, E. L., & VanIngen-Dunn, C., & Gallegos, A. T., & DeWitt, E. (2020, June), *Emerging Role of 2-year Hispanic-serving Institutions (HSIs) in Advanced Technological Education (ATE): Challenges, Opportunities, and Impacts for Growing the United States Technical Workforce* Paper presented at 2020 ASEE Virtual Annual Conference Content Access, Virtual Online . 10.18260/1-2--34523

Pickering, C, Craft, E, VanIngen-Dunn, C, "The Emerging Impact of Community College Hispanic-Serving Institutions (2-year HSIs) in Educating Technicians in Advanced Technologies – Defining the Opportunities and Addressing the Challenges," 2019 ASEE Annual Conference Proceedings, June 15, 2019

Pickering, C, VanIngen-Dunn, C, Grierson, A, Tanguma, A, "KickStarter: Providing Hispanic Serving Community Colleges with Technical Assistance to Improve their Federal Funding Competitiveness", 2018 ASEE Annual Conference Proceedings, June 23, 2018

VanIngen-Dunn, C, Pickering C, McBride, P, Fick, V, Slisz, J, "Meeting STEM Workforce Demand in a Statewide Rural Community College Collaborative", 2018 ASEE Annual Conference Proceedings, June 23, 2018

C. VanIngen-Dunn, C. Pickering, L. Coyle, A. Grierson, S. Frimer and V. Fick, "Community College STEM Pathways Guide: A Collaborative Online System for Design and Implementation of STEM Pathway Programs," *2016 International Conference on Collaboration Technologies and Systems (CTS)*, Orlando, FL, 2016, pp. 158-164

Pickering, C, Gupta, M, "Self Service Business Intelligence (SSBI) for Employee Communications and Collaboration (ECC)", IEEE Proceedings of the International Conference on Collaboration Technologies and Systems 2015, June 2015

McCreary, F, Gomez, M, Mcewan, A, Michalak S, Pickering C, "A Case Study in Seeding Collaboration Transformation with Experience Themes" IEEE, 5/20/2014

Pickering, C, "Synergizing People, Process, and Technology to Motivate Knowledge Sharing and Collaboration", IEEE Proceedings of the International Conference on Collaboration Technologies and Systems 2013, June 2013

Cummings, J, Espinosa, J A, “Time Separation, Coordination, and Performance in Technical Teams”, IEEE Transactions on Engineering Management, 2010, April 2011

Sud, S, Pickering, C, “Computation Mobility and Virtual worlds – not just where you work, but how you work”, Advances in Next Generation Services and Service Architectures (ANGSA); River Publishers, February 2011

Zhang, J, Sheng, Y, Hao, W, Tian, P, Miao, K, Wang, P, Pickering, C, “A Context-aware Framework Supporting Complex Ubiquitous Scenarios with Augmented Reality Enabled”, International Conference on Pervasive Computing and Application (IEEE ICPCA), December 2010

Cummings, J., Espinosa, J.A., and Pickering, C. "Crossing Spatial and Temporal Boundaries in Globally Distributed Projects: A Relational Model of Coordination Delay," Information Systems Research Journal (20:3), September 2009, pp. 420-439

Cummings, Jonathon, Espinosa, J Alberto, and Pickering, Cynthia; “Spatial and temporal boundaries in global teams: Distinguishing where you work from when you work,” Proceedings of the IFIP WG 8.2/9.5 Working Conference on Virtuality and Virtualization, July 28-31, 2007

Espinosa, J Alberto, Cummings, Jonathon, and Pickering, Cynthia, Working on Technical Projects Across Time Zones: A Field Study of Coordination and Performance in Global Teams at Intel Corporation, ACM SIGCOMM, 2007

Baldwin E., Pickering C., Smith D., Abecassis D., Molenaur A. (2007) Game Architecture and Virtual Teamwork. In: Crowston K., Sieber S., Wynn E. (eds) Virtuality and Virtualization. IFIP International Federation for Information Processing, vol 236. Springer, Boston, MA

Espinosa, J Alberto, Cummings, Jonathon, and Pickering, Cynthia, “Your Time Zone or Mine? Geographic Configurations, Global Team Coordination, and Project Outcomes,” Academy of Management Conference, August 2006

Pickering, Cynthia, et al, “3D Global Virtual Teaming Environment,” Proceedings of the Fourth International Conference on Creating, Connecting, and Collaborating through Computing (C5 2006), January 26-27th, 2006, IEEE Computer Society, 2006

Espinosa, J Alberto and Pickering, Cynthia, “The Effect of Time Separation on Coordination Processes and Outcomes: A Case Study,” Proceedings of the Thirty-ninth Annual Hawaii International Conference on System Sciences (CD/ROM), January 4-8, 2006, Computer Society Press, 2006. Ten pages

Pickering, C.; Wynn, E. “An Architecture and Business Process Framework for Global Team Collaboration.” Intel Technology Journal. November 2004

Pickering, Cynthia, “Using IT Concept Cars to drive innovation,” in IT Innovation for Adaptability and Competitiveness, Fitzgerald, B and E Wynn, editors, IFIP WG 8.6 Working Conference, Kluwer Academic Publishers, Dordrecht, Holland, 2004

Dodhiawala, R., Sridharan, N.S., Raulefs, P., Pickering, C.; Real-time AI Systems: A Definition and An Architecture; Eleventh Annual IJCAI; Detroit, Michigan; August 20-25, 1989

Dodhiawala, R., Sridharan, N.S., Pickering, C. (1989), A Real-time Blackboard Architecture in *Blackboard Architectures and Applications*; Dodhiawala, Jagannathan, and Baum (eds.), Academic Press, Inc., pp. 219-239

Powell, Pickering, Wescourt; System Integration of Knowledge-based Maintenance Aids; AAAI; Philadelphia, PA; Aug 15, 1986

Pickering, Powell, Wescourt; A Generic Architecture for Knowledge-Based Equipment Fault Diagnosis; Contributed paper; Air Force Workshop on AI Applications for Integrated Diagnostics; AFSC/PLLM, AFWAL/FI & AFWAL/AA; Boulder, CO; July 29-31,1986

Powell, Pickering, Wescourt; System Integration of Knowledge-based Maintenance Aids; Contributed paper; Air Force Workshop on AI Applications for Integrated Diagnostics; AFSC/PLLM, AFWAL/FI & AFWAL/AA; Boulder, CO; July 29-31,1986

Wescourt, Powell, Pickering; R2Q73-85-1 A Generic Expert Systems Architecture for Equipment Fault Diagnosis Applications; Dec 27, 1985

Powell, Pickering, Wescourt, Whitehead; A Mark 45 Fault Diagnosis Advisor; ADPA/TRADOC "Artificial Intelligence and Robotics Symposium; Austin, TX; Nov. 7, 1985

Wescourt, Powell, Pickering, Whitehead; Generic Expert Systems for Equipment Fault Diagnosis; IEEE "19th Asilomar Conference on Circuits, Systems, and Controls"; Asilomar, CA; Nov. 7, 1985

Bein, Fritzsche, Pickering, Pistole, Staub; FIES: An Expert System for Isolating Faults of Spacecraft Hardware; Artificial Intelligence Unit, Martin Marietta Denver Aerospace; 1984

US PATENT

Issued 03/08/2011, Patent# 7904323, Multi-Team Immersive Integrated Collaboration Workspace

US COPYRIGHT

Issued June 16,2016, Copyright# TX 8-289-291 Engineering Notebook for SFAz Community College STEM Pathways Guide

ACADEMIC PRESENTATIONS

1. Pickering, C., & Lopez, M., & Gonzalez, G., & Garcia, M., & Vaningen-Dunn, C., & Pinto, K. (2022, August), *Work-based Experiential Learning in IT: Career Enhancement for Underserved Students at a 2-year HSI* Paper presented at 2022 ASEE Annual Conference & Exposition, Minneapolis, MN. https://peer.asee.org/41378

2. Pickering, C., & Miller McNeill, L., & Lopez, M., & Rodriguez, J., & Belknap, S., & Craft, E., & Vaningen-Dunn, C. (2022, August), *Theory to Practice: Professional Development for Culturally Responsive Technician Education* Paper presented at 2022 ASEE Annual Conference & Exposition, Minneapolis, MN. https://peer.asee.org/41374

3. Pickering C. K., Fisher E., Ross, P. (2021, Dec), One Step at a Time: Deepening Socio-technical Learning in Undergraduate ICT Externships to Bridge the Digital Divide, 11th International Conference on Internet Technologies & Society (ITS), Virtual Conference.

4. Pickering, C. K., & Craft, E. L., & VanIngen-Dunn, C., & DeWitt, E., & Roberts, R. H. (2021, July), *The Road to Strengthening Two-year Hispanic-Serving Institution Participation in the NSF ATE Funding Program* Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. https://peer.asee.org/37889

5. Pickering, C. K., & VanIngen-Dunn, C., & Reyes, M. A. (2021, July), *Work-focused Experiential Learning to Increase STEM Student Retention and Graduation at Two-year Hispanic-serving Institutions* Paper presented at 2021 ASEE Virtual Annual Conference Content Access, Virtual Conference. https://peer.asee.org/38212

6. C.K., & Reyes M.A. (2021 Nov 5),*Work-Based Experiential Learning: High Impact Practices to Intentionally Serve Latinx Students in Computing Programs at 2-yr HSIs*, Poster presented at AAC&U TRANSFORMING STEM HIGHER EDUCATION Nothing Stays the Same: Reflecting on, Reckoning with, and Re-engineering Undergraduate STEM Education, Virtual Conference.

7. Pickering, C. K., (2021, Dec 3), One Step at a Time: Deepening Socio-technical Learning in Undergraduate ICT Externships to Bridge the Digital Divide, College of Global Futures Student Showcase.