Insup Lee*

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Education

- **Ph.D. in Computer Science**
  University of Wisconsin-Madison, May, 1983.
  Dissertation title: *DYMOS: A Dynamic Modification System*
- **M.S. in Computer Science**
  University of Wisconsin-Madison, December, 1978.
- **B.S. in Mathematics with Honors**
  University of North Carolina at Chapel Hill, May, 1977.

Employment

- 9/05-present: Cecilia Fitler Moore Professor of Computer and Information Science, University of Pennsylvania, Philadelphia, PA
- 9/22-present: Professor, Department of Biostatistics, Epidemiology and Informatics, Perelman School of Medicine (Secondary)
- 7/12-12/17, Distinguished Adjunct Professor, Department of Information and Communication Engineering, DGIST, Korea.
- 3/08-6/08: Distinguished Visiting Professor, Korea University, Seoul, Korea
- 9/04-1/10: Consultant, Fremont Associates, LLC
- 9/03-present: Professor of Electrical and Systems Engineering (Secondary)
- 7/97-present: Professor, Department of Computer and Information Science, University of Pennsylvania, Philadelphia, PA
- 7/89-6/97: Associate Professor, Department of Computer and Information Science, University of Pennsylvania, Philadelphia, PA
- 6/89-9/00: Consultant, Computer Command and Control Company, Philadelphia, PA
- 7/83-6/89: Assistant Professor, Department of Computer and Information Science, University of Pennsylvania, Philadelphia, PA
- 1/83-5/83: Instructor, Computer Sciences Department, University of Wisconsin-Madison, Madison, WI
- 6/79-7/79: Visiting Research Assistant to Korean Institute of Science and Technology, Seoul, Korea, on a Scholarship from KSEA (Korean Scientist and Engineers Association in America)
- 1/78-12/82: Research/Teaching Assistant, Computer Sciences Department, University of Wisconsin-Madison, Madison, WI

*Updated on 9 May 2025.

Position

- 7/21-12/24, Founder, VitalCore Software Inc. (PCIV UPstart Company)
- 1/19-8/24, Founding Co-Editor-in-Chief, ACM Transactions on Computing for Healthcare.
- 9/08-present, Director, PRECISE Center, School of Engineering and Applied Science, University of Pennsylvania, Philadelphia, PA (https://precise.seas.upenn.edu/)
- 1/17-6/20, Founding Co-Director, Penn Center for Health, Devices and Technology, University of Pennsylvania (https://healthtech.upenn.edu/)
- 7/15-6/19, Chair, ACM SIGBED - Special Interest Group on Embedded Systems. ACM SGB EC Member-at-Large, 2016-2018.
- 1/03-12/04, Chair, IEEE Computer Society TCRTS (Technical Committee on Real-Time System).
- 1/01-12/02, Vice Chair, IEEE Computer Society TCRTS (Technical Committee on Real-Time System).
- 7/94-6/97: CSE Undergraduate Curriculum Chair, Department of Computer and Information Science, University of Pennsylvania, Philadelphia, PA

Awards and Honors

- IEEE Technical Committee on Cyber-Physical Systems (TCCPS) Distinguished Leadership Award. For exceptional contributions to establishing cyber-physical systems as a scientific discipline and continued growth of the community; for pioneering research and leadership in medical cyber-physical systems. 2023
- AAAS Fellow, For foundational contributions to the theory and implementation of real-time compositional scheduling and runtime verification, 2022.
- ACM SIGBED Inaugural Distinguished Leadership Award, October 12, 2022. For leadership in promoting cross-fertilization of ACM and IEEE communities in Cyber-Physical Systems, Embedded Systems, and Real-Time Systems.
- IEEE Life Fellow, 1 January 2021.
- RV Test-of-Time Award, Runtime Verification 2019.
- Deans' Distinguished Visiting Professorship, Perelman School of Medicine, University of Pennsylvania, 17 January 2019.
- ACM Fellow, For theoretical and practical contributions to compositional real-time scheduling and runtime verification, 2017.
- Member, NRC's Committee on 21st Century Cyber-Physical Systems Education, 2014-2015.
- Appreciation Plaque, Ministry of Science, IT and Future Planning, South Korea, 9 August 2013.
- 3rd KOCSEA (Korean Computer Scientists and Engineers Association in America) Appreciation Award, 2011.
- IEEE TC-RTS Outstanding Technical Achievement and Leadership Award, Dec 2008.
- The Edward M. Kennedy Award for Health Care Innovation 2007, CIMIT (Center for Integration of Medicine and Innovative Technology), Medical Device "PnP" Interoperability Team, Julian Goldman (leader), Dave Arney, Insup Lee, et al.

- Member, President's Council of Advisors on Science and Technology (PCAST) Networking and Information Technology (NIT) Technical Advisory Group (TAG), 2006-2007.
- DVP Speaker of IEEE Computer Society Distinguished Visitors Program (DVP), 2004-2006.
- IEEE Fellow, For contributions to the specification languages and verification tools for real-time systems, 2001.
- KSEA Certificate of Appreciation "in recognition of excellent contribution to KSEA as Co-Chair of ICTS at the 2005 US-Korea Conference (UKC 2005)."
- IEEE Computer Society's Certificate of Appreciation
  - "for your important contributions to ISORC 2006 as a Symposium Co-Chair," April 25, 2006.
  - "for his important contributions to the ISORC 2004 as Program Co-Chair," May 12, 2004.
  - "for your important contributions to the development of the 1st IEEE CS Symposium on Object-oriented Real-time Distributed Computing program as Program Co-Chair," April 20, 1998
  - "for an outstanding performance as co-chairs of the 1992 and 1993 Real-Time Systems Symposiums," Feb 23, 1994.
- Board of Directors, Philip Jaisohn Memorial Foundation, Philadelphia, since 1995.
- ACM Certification of Appreciation "in recognition of advice and guidance to the University of Pennsylvania Programming Team at the ACM Allegheny Regional Scholastic Programming Contest." Second Place, Allegheny Regionals, Division I, 1990.
- Honorary Masters Degree, University of Pennsylvania, 1989.

Awards with Students and Postdoc Fellows

- ACM Transactions on Embedded Computing Systems (TECS) Best Paper Award 2022, Oct 13, 2022, for the paper: Ivanov, Radoslav, Taylor J. Carpenter, James Weimer, Rajeev Alur, George J. Pappas, and Insup Lee. Verifying the safety of autonomous systems with neural network controllers. ACM Transactions on Embedded Computing Systems (TECS) 20, no. 1 (2020): 1-26.
- Distinguished Paper Award. Yahan Yang, Ramneet Kaur, Souradeep Dutta, Insup Lee. Interpretable Detection of Distribution Shifts in Learning Enabled Cyber-Physical Systems, ICCPS, May 2022.
- Best Contributed Theoretical Paper Award. Alan Ismaiel, Ivan Ruchkin, Jason Shu, Oleg Sokolsky, Insup Lee. Data Generation with PROSPECT: a Probability Specification Tool. Winter Simulation Conference (WinterSim). Phoenix, Arizona, 2021.
- Outstanding Paper Award, Real-Time Networks and Systems (RTNS). Towards Virtualization-Agnostic Latency for Time-Sensitive Applications. Haoran Li, Meng Xu, Chong Li, Chenyang Lu, Christopher Gill, Linh Phan, Insup Lee and Oleg Sokolsky. April 2021.
- Best Paper Award, ACM-IEEE International Conference on Formal Methods and Models for System Design (MEMOCODE). Detecting Security Leaks in Hybrid Systems with Information Flow Analysis. Luan Nguyen, Gautam Mohan, James Weimer, Oleg Sokolsky, Insup Lee and Rajeev Alur. Oct 2019.
- Best Paper Award, IEEE Real-Time and Embedded Technology and Applications Symposium (RTAS). Holistic resource allocation for multi-core real-time systems. Meng Xu, Linh Thi Xuan Phan, Hyon-Young Choi, Yuhan Lin, Haoran Li, Chenyang Lu, Insup Lee. April 2019.
- Best Paper Award, IEEE Int. Symposium on Real-Time Computing (ISORC). Data Freshness Over-Engineering: Formulation and Results. Dagaen Golomb, Deepak Gangadharan, Sanjian Chen, Oleg Sokolsky, and Insup Lee. May 2018.

- Best Paper Award, Adaptive Transient Fault Model for Sensor Attack Detection, IEEE Int. Conf. on Cyber-Physical Systems, Networks, and Applications (CPSNA), Minsu Jo, Junkil Park, Yungmi Baek, Radoslav Ivanov, James Weimer, Sanghyuk Son, and Insup Lee, Oct 6-7, 2016.
- Best Paper Award, ACM/IEEE International Conference on CPS (ICCPS), Robustness of Attack-resilient State Estimators, Miroslav Pajic, James Weimer, Nicola Bezzo, Paulo Tabuada, Oleg Sokolsky, Insup Lee and George J. Pappas, April 2014.
- Best Paper Award, IEEE Real-Time Systems Symposium (RTSS), Hoon Sung Chwa, Hyoungbu Back, Sanjian Chen, Jinkyu Lee, Arvind Easwaran, Insik Shin and Insup Lee, Extending Task-level to Job-level Fixed Priority Assignment and Schedulability Analysis Using Pseudo-deadlines, Dec 2012.
- Best Student Paper Award, Miroslav Pajic, Zhihao Jiang, Insup Lee, Oleg Sokolsky and Rahul Mangharam, "From Verification to Implementation by Model Translation and a Pacemaker Case Study," IEEE RTAS, April 2012.
- Co-Best Paper Award, CEAS '11, "Link Spamming Wikipedia for Profit," West, A.G., Chang, J., Venkatasubramanian, K., Sokolsky, O., and Lee, I., CEAS '11: 8th Annual Collaboration, Electronic Messaging, Anti-Abuse, and Spam Conference, Sept 2011.
- Dissertation Advisor, Bronze Prize, Samsung Electronics' Humantech Thesis Contest, Dissertation on "A Design Framework for Real-Time Embedded Systems with Code Size and Energy Constraints" by Insik Shin and Sheayun Lee, Feb 2005. (Co-advised with Professor Sang Lyul Min at SNU)
- Best Paper Award, IEEE Real-Time Systems Symposium (RTSS), "Periodic Resource Model for Compositional Real-Time Guarantees," (with Insik Shin) Dec 2003.

Research Interests

- Cyber-Physical Systems (CPS), Real-Time Embedded Systems, Medical Cyber Physical Systems/Internet of Medical Things, Model-Based Development, Runtime Verification, Assurance Cases, Safe Autonomy

Professional Societies

- Member of American Association for the Advancement of Science (AAAS)
- Member of Association of Computing Machinery (ACM)
- Member of IEEE Computer Society
- Member of KOCSEA (Korean-American Computer Scientists and Engineers Association)
- Member of KSEA (Korean-American Scientists and Engineers Association)

Professional Activities - Editorial Boards

- Founding Co-Editor-in-Chief, ACM Transactions on Computing for Healthcare, since 2018.
- Editorial Board, ACM Transactions on CPS, 2015-2018.
- Editorial Board, Proceedings of IEEE, 2014-2019.
- Area Editor for Real-Time Systems, Embedded Systems, and Cyber-Physical Systems, *Journal of ACM*, 2013-2017.
- Founding Co-Editor-in-Chief, KIISE Journal of Computing Science and Engineering (JCSE), since Sept 2007.

- *Real-Time Systems: The International Journal of Time-Critical Computing Systems*: Associate Editor (2003-2010), Advisory Board since 2010.
- Editorial Board: *Formal Methods in System Design*, 1996-2017.
- Editorial Board, *Journal of Electrical Engineering and Information Science*, 1998-2001.
- Editorial Board, *IEEE Transactions on Computers*, 1995-2000.

Professional Activities - Service and Leadership

- Member, the IEEE Computer Society Fellow Evaluation Committee, 2020
- Chair, ACM SIGBED - Special Interest Group on Embedded Systems, 2015-2019. ACM SGB EC Member-at-Large, 2016-2018. SIG Governing Board Awards Committee Liaison, 2016-2018.
- Chair, IEEE Computer Society Technical Committee on Real-Time System, 2003-2004.
- Vice Chair, IEEE Computer Society Technical Committee on Real-Time System, 2001-2002.
- Naval Research Lab (NRL) External Research Review Panel for Information Technology S&T Program (1997, 2004)
- President, Philadelphia Chapter of KSEA (Korean-American Scientists and Engineers in America), 1990-1991.

Professional Activities - Steering and Advisory Committees

- Steering Committee, CPS Week (since 2008, Chair 2012), ES Week (2007-2013), ATVA (since 2004), ISORC (since 2010), Run-Time Verification (since 2002), CPS-VO Education Group (since 2011)
- Steering Committee, Chair, ICCPS (since 2015)
- Advisory Committee: Co-Chair, MobiQuitous 2016, Hiroshima; CyPhy (since 2014),
- Advisory Committee, Body Sensor Network Contest, May 23, 2011. http://bsncontest.org/; IEEE RTCSA 2013.
- Advisory Board: CPS Summer School, Georgia Institute of Technology, June 22-26, 2009;

  Advisory Board, International Conference on Embedded and Real-Time Computing Systems and Applications (RTCSA), 2004-2006.
- Co-Chair, IEEE CS Technical Steering Committee on Embedded Systems, 2005-2006.
- Steering Committee, International Conference on Real-Time Computing Systems and Applications (RTCSA), 1996-2002.
- Executive Committee: ACM SIGBED (2006-2012); Executive Committee, IEEE CS Technical Committee on Real-Time Systems, 1994-1996, 2005-2012; Executive Committee, EMSOFT (2005-2013)
- Advisory Committee, IT Symposium, UKC 2007, Aug 9-12.
- Executive Committee, KOCSEA (Korean-American Computer Scientists and Engineers Association), 1995-2001.
- Steering Committee Chair, NRC '98, The 9th KSEA Northeast Regional Conference, Rutgers University, New Brunswick, NJ, March 6-7, 1998.

Professional Activities - Conference and Workshop Chairs

- General Co-Chair, CHASE 2024, Wilmington, Delaware.
- Program Co-Chair, CHASE 2017, Philadelphia.
- General Co-Chair, CPSWeek 2013, Philadelphia.
- General Co-Chair, ICCPS 2012.
- Workshop Co-Organizer, SoSMD 2012.
- Program Co-Chair, ICCPS 2011.
- General Co-Chair, 1st Int. Conf. on Runtime Verification, Nov 1-4, 2010, Malta.
- Co-organizer, 2nd workshop on HCMDSS and MD PnP, CPS Week, San Francisco, April 2009.
- Co-organizer, CRTS (Compositional Real-Time Systems) Workshop. (Dec 2008, Dec 2009, Dec 2010)
- General Co-Chair, *Int. Conf. on Embedded and Real-Time Computing Systems and Applications (RTCSA)*, Taipei, Taiwan, Aug 2008.
- Workshop Co-Chair, *Workshop on Software and Systems for Medical Devices and Services (SMDS)*, Dec 3, 2008.
- Co-organizer, Joint workshop on High-Confidence Medical Devices, Software, and Systems/ Medical Device Plug-and-Play (HCMDSS/MD PnP). (Boston, June 25-27, 2007; San Francisco, April 16, 2009)
- Symposium Co-Chair, *IEEE ISORC*, Gyeongju, Korea, Apr 24-26, 2006.
- General Chair, *Int. Workshop on Automated Technology for Verification and Analysis (ATVA)*, Taipei, Taiwan, Oct 2005.
- Co-Chair, *Information & Communication Technology Symposium (ICTS)* KSEA UKC 2005, Aug 2005.
- Chair Organizer, High-Confidence Medical Device Software and Systems (HCMDSS) Workshop, Philadelphia, PA, June 2-3, 2005 (www.cis.upenn.edu/hcmdss/)
- Co-organizer, High-Confidence Medical Device Software and Systems (HCMDSS) Planning Workshop, Arlington, VA, Nov 16-17, 2004. (www.cis.upenn.edu/hcmdss-planning/)
- Program Co-Chair, *IEEE Int. Symposium on Object-oriented Real-time distributed Computing (ISORC)* Vienna, Austria, May 12-14, 2004.
- Program Co-Chair, *Int. Workshop on Automated Technology for Verification and Analysis (ATVA)*, Taipei, Taiwan, Dec 10-13, 2003.
- Program Co-Chair, *Int. Conf. on EMSOFT*, Philadephia, Oct 13-15, 2003.
- Program Co-Chair, *Monterey Workshop on Software Engineering fro Embedded Systems: From Requirements to Implementation*, Chicago, Sep 24-26, 2003.
- General Co-Chair, *IEEE Int. Symposium on Object-oriented Real-time distributed Computing (ISORC).* [Newport Beach, CA, March 15-17, 2000], [KyounJu, Korea, April 24-26, 2006]
- Program Co-Chair, *IEEE Int. Symposium on Object-oriented Real-time distributed Computing (ISORC)*, Kyoto, Japan, April 20-22, 1998.
- Program Co-Chair, *Int. Workshop on Real-Time Computing Systems and Applications (RTCSA)*, Seoul, Korea, Oct 30 - Nov 1, 1996.

- Conference Co-Chair, *CONCUR '95 – Int. Conf. on Concurrency Theory*, Philadelphia, PA, Aug 1995.
- Program Co-Chair, *Int. Workshop on Real-Time Computing Systems and Applications (RTCSA)*, Seoul, Korea, Dec 1994.
- General Co-chair, *IEEE Real-Time Systems Symposium*, Dec 1993.
- Program Co-Chair, *IEEE Real-Time Systems Symposium*, Dec 1992.
- Conference vice-chairman, *KSEA Northeast Regional Conference*, Lehigh University, Nov 1988.

Professional Activities - Program Committees

- ACM/IEEE CHASE 2018
- RV: *International Conference on Runtime Verification* (2013, 2014, 2015, 2018)
- RTSS: *IEEE Real-Time Systems Symposium* (1985-1988, 1990, 1992, 1996, 1998-2002, 2004, 2006, 2007, 2008, 2009, 2010, 2011, 2012)
- SIES 2013
- ISEP-IPP 2013
- DSMDS 2011
- EMSOFT: *ACM Conference on Embedded Software* (2003, 2004, 2005, 2008, 2011)
- ICHI (IEEE Int. Conference on Healthcare Informatics), 2013.
- ISORC: *IEEE Int. Symposium on Object-oriented Real-time distributed Computing* (1998, 2002-2005, 2007, 2009, 2010, 2012, 2013)
- RTAS: *IEEE Real-Time and Embedded Technology and Applications Symposium* (1990, 1998, 2000, 2001, 2004, 2007, 2009, 2015)
- ICCPS: *International Conference on Cyber-Physical Systems* (2010, 2013)
- SRDS *IEEE Symposium on Reliable Distributed Systems* (2012, 2013)
- DAC (2011)
- FTRA WCC-WTA 2011, The 7th International Symposium on Wireless sensor network Technologies and Applications for Smart Space (WTA 2011)
- CPNS (International Workshop on Cyber-Physical Networking Systems) (2011, 2012)
- RTCSA: *Int. Conference on Real-Time Computing Systems and Applications* (1994-1996, 1999, 2000, 2004, 2005, 2010, 2011, 2014)
- ECRTS: *Euromicro Conference on Real-Time Systems* (1999, 2003, 2004)
- ATVA: *Int. Sypmposium on Autoated Technology for Verification and Analysis* (2003, 2004, 2006, 2007, 2009, 2010, 2011, 2012, 2013, 2014)
- ICTAC 2014
- ICCAD: Conference for Electronic Design Technology (2011, 2012)
- ICECCS (7th IEEE International Conference on Engineering of Complex Computer Systems) 2012.

- ICFEM (14th International Conference on Formal Engineering Methods) 2012.
- Wireless Health (WH) 2011, 2014, 2015
- BSN (Body Sensor Networks) 2010
- LCTES 2009, *ACM Conf. on Languages, Compilers, and Tools fro Embedded Systems*, Dublin, Irland
- FHIES *Int. Symposium on Foundations of Health Information Engineering and Systems* (2011, 2012, 2013, 2014)
- IEEE PIMRC 11, Wireless Networks and Health Care Track, Sept 2011, Toronto, Canada.
- FM2009, Eindhoven, the Netherlands.
- SSS *(Int. Symposium on Stabilization, Safety, and Security of Distributed Systems)* (2009, 2012)
- ICTAC (international Colloquium on Theoretical Aspects of Computing), Aug 2009.
- ACM SAC track on Real-Time Systems (2009, 2011)
- CSA (Int. Conf. on Computer Science and its Applications), Jeju, Korea, Dec 2009
- FORMATS: *Int. Conf. on Formal Modeling and Analysis of Timed Systems* (2005, 2007, 2008, 2009, 2012)
- CASES: *Int. Conf. on Compilers, Architectures, and Synthesis for Embedded Systems* (2006)
- ICCP: *Int. Conf. on Intelligent Computer Communication and Processing* (2006)
- ICSOFT: *Int. Conf. on Software and Data Technologies* (2006, 2007)
- ETFA: Emerging Technologies and Factory Automation, 2009
- MEMOCODE: *ACM-IEEE Int. Conf. on Formal Methods and Models of Codesign* (2005)
- ICDCS: *IEEE Int. Conference on Distributed Computer Systems* (1999, 2001, 2003, 2012)
- FORTE: *Formal Techniques for Networked and Distributed Systems* (2002)
- EUC: *IFIP Int. Conference on Embedded and Ubiquitous Computing*, (2007).
- ASP-DAC: *Asia South Pacific Design Automation Conference* (2005)
- ICESS: *Int. Conference on Embedded Software and Systems.* (2004, 2007)
- QSIC: *Int. Conference for Quality Software* (2003, 2004, 2005, 2006)
- *KSEA UKC ICT (Information & Communication Technology) Symposium* (2003, 2006)

Professional Activities - Workshop Committees

- SafeThings: 2017, 2020, 2021
- APRES, 2011, 2014
- ASSURE (1st Int. Workshop on Assurance Cases for Software-intensive Systems), 2013
- Workshop on Open Resilient human-aware Cyber-physical Systems (WORCS), 2013
- SEHC 2012, 2013, 2014

- USENIX HealthSec Workshop (2012, 2013)
- 1st Int. Workshop on Large-Scale Cyber-Physical Systems (LCPS 2011), Dec 12-13, 2011.
- First Workshop on Future Directions in Cyber-physical Systems Security, US DHS, July 22-24, 2009.
- RV: *Workshop on Runtime Verification* (2001, 2002, 2006, 2009)
- IEEE International Workshop on Component-Based Design of Resource-Constrained Systems (CORCS 2008, 2009, 2012)
- WCPS: Int. Workshop on Cyber-Physical Systems (2009, 2008)
- WSNHC: *Wireless Sensor Networks for Health Care* (2007)
- HSCC: *Int. Workshop on Hybrid Systems: Computation and Control* (2005)
- JTRES: Workshop on Java Technologies for Real-time and Embedded Systems (2005)
- WORDS: *IEEE Int. Workshop on Object-oriented Real-time Dependable Systems* (1996, 1997, 1999, 2001, 2003, 2005)
- TeleHealth: *1st Int. Workshop on TeleHealth* 2008.
- TPTS: *Workshop on Theory and Practice of Timed Systems* (2002)
- WPDRTS: *Int. Workshop on Parallel and Distributed Real-Time Systems* (2000, 2001, 2002)
- RSP: *IEEE Int. Workshop on Rapid System Prototyping* (2000, 2001)
- *IEEE Int. Workshop on Distributed Real Time Systems* (2000)
  ARO/NSF Monterey Workshop on Increasing the Practical Impact of Formal Methods for Computer-Aided Software Development (1998)
  ACM Workshop on Language, Compiler, and Tool Support for Real-Time Systems (1995)
  Formal Tech in Real Time and Fault Tolerant Systems, Schleswig, Germany (1994)
  North America Process Algebra Workshop, Ithaca, NY, Aug 1993.

Professional Activities - Miscellaneous

- Advisory Member, KOCSEA President Election Board (2009, 2012)
- Organization Committees:
  Workshop on Software Engineering and Programming Languages (1996)
  Mini-track Coordinator for Distributed Real-Time Systems, Hawaii Int. Conf. on System Sciences (1996)
  ARO Workshop on Formal Methods: Automatic Verification (1993)
  ARO Workshop on Formal Methods: Real-Time Systems (1992)
  ARO Short Courses on *Introduction to Parallel Architectures, Processing and AI Applications* (1986, 1987, 1988)
  Local arrangements,*8th Int. Symposium on Protocol Specification, Testing, and Verification* (1988)
- NSF Proposal Review Panels
- Award Selection Committee, "Being an Korean-American" essay contest for high school students, Philip Jaisohn Memorial Foundation. (1996-2001)
- Board of Advisors for KASCON VIII (Korean-American Students Conference) Philiadelphia, PA (April 1994).

- Ph.D. Program Evaluation Team for Computer Science and System Science Department, State University of NY at Binghamton, Sept 1992.

Courses Taught at the University of Pennsylvania

- CSE 341 – Compilers (Spring 1991, Fall 1991)
- CSE 380 – Introduction to Operating Systems (Spring 1984-1989, Fall 1994, Fall 1996-2000, Fall 2003)
- CSE 400/401 – Senior Design Projects (Fall 2008, Spring 2009, Fall 2009, Spring 2010, Fall 2010, Spring 2011, Fall 2011, Spring 2012, Fall 2012, Spring 2013, Fall 2013, Spring 2014, Fall 2014, Spring 2015)
- CIS 441/541 – Embedded Software for Life-Critical Applications (Fall 2010-2020, Spring 2022)
- CSE 480 – Distributed and Real-Time Systems: New course designed and developed with the NSF equipment grant, "Teleconferenced Workstations: Improving Experimentation in Undergraduate Education." (Spring 1994, Spring 1996) Real-Time and Embedded Systems (Fall 2006)
- CIS 505 – Software Systems (Spring 2005-2007)
- CIS 523 – Programming Languages (Fall 1984)
- CIS 541 - Embedded and Cyber Physical Systems (Spring 2010)
- CIS 570 – Operating Systems (Fall 1983)
- CIS 640 – Advanced Topics in Computer Systems: Software Engineering (Spring 1995), Mobile Computing (Spring 1998), E-commerce and E-auction (Spring 2000)
- CIS 640 – Advanced Topics in Software Systems: Software Reliability Methods and Embedded Systems (Fall 2002); Embedded Systems and Sensor Networks (Spring 2004)
- CIS 642 – Seminar in Real-Time Computing (Fall 1989, Fall 1990, Spring 1992, Fall 1993, Fall 1995, Spring 1999, Spring 2001)
- CIS 671 – Advanced Topics in Operating Systems (Spring 1985, Spring 1989)
- CIS 799A – Seminar in Distributed Computing (Fall 1984-1987)
- CIS 800 – Topics in Cyber-Physical Systems (Spring 2012)
- EMTM 553 – Electronic Commerce Systems (Winter 2001, Spring 2001)

Courses Taught at the University of Wisconsin-Madison

- CS 302 – Algebraic Language Programming (Fall 1978, Spring 1979)
- CS 536 – Introduction to Programming Languages and Compilers (Spring 1983)
- CS 537 – Introduction to Operating Systems (Summer 1981)

Selected SEAS and CIS Activities

- ASSET (Center for AI-enabled systems: Safe, Explainable and Trustworthy) Executive Committee Member (since 2022)
- Director, PRECISE Center (since 2008)
- Selection Committee, SEAS/PSOM Trustworthy AI Call-for-Proposals (2022)

- CIS Lecturers' Mentoring Committee (2014-2016)
- CIS Diversity Hiring Committee (2012-2013)
- SEAS Pender Award Committee (2012-2014)
- Senate Committee on Faculty and the Administration (SCOA) member (2011-2012)
- SEAS Faculty Council (2008-2010)
- SEAS Faculty Personnel Committee (2000-2001, 2005-2007)
- SEAS Search Committee for ESE Chair (2002-2004)
- CSE Undergraduate Curriculum Revision/Evaluation Committee (2002-2003, 2010-present)
- SEAS Committee on Intellectual Properties (2001)
- CIS Building Committee (1998-2000)
- CIS Undergraduate Curriculum Chair (1994-1997)
- Secretary of the SEAS Faculty (1993-1994)
- SEAS Staff Recognition Award Committee (1993-1994)
- CIS Faculty Recruiting Committee (1993-1994, Chair 1998-1999, 1999-2001, Chair 2002-2003, 2005, 2006, 2021)
- CIS WPE (Written Preliminary Exam) Committee (1984-1985, 1987-1988, Chair 1988, 1991-1992, 1992-2000, 2005-2007); WPE Revision Committee (1990-1991, 1993)
- Founding Faculty Advisor of the CSE Dining Philosophers (1989-1992) (Dining Philosophers were named after the famous concurrency problem with the same name taught in CSE 380 operating systems course.)
- Faculty Advisor of Student ACM Chapter (1984-1986, 1989-1992)
- Editor-in-Chief, CIS Newsletter (1991-1992)
- SEAS Search Committee for the Professorial Chair in Telecommunications (Jan 1986-Jan 1988)
- Department Colloquium Chair (1985-1986, 1991)
- Secretary of CIS Department (1985)
- Member of the SEAS Network Task Group (1984-1985)

Ph.D. Dissertation Supervision

1. David Smitley, *The Utilization of Processors Interconnected with a Reconfigurable Network*, May 1987. (Started as Research Scientist, Supercomputing Research Center, Lanham, Maryland)
2. Amy Zwarico, *An Algebraic Model for Communicating Time-Dependent Processes*, May 1988. (Started as Assistant Professor, Computer Science Department, the Johns Hopkins University, Baltimore, Maryland)
3. Richard Gerber, *Communicating Shared Resources: A Model for Distributed Real-Time Systems*, August 1991. (Started as Assistant Professor, Department of Computer Science, University of Maryland, College Park, Maryland) (Received the Morris and Dorothy Rubinoff Award for the best CIS Ph.D. dissertation, 1992)

4. Victor Wolfe, *Supporting Real-Time Concurrency*, August 1991. (Co-supervised with Susan B. Davidson) (Started as Assistant Professor, Department of Computer Science, The University of Rhode Island, Kingston, RI)

5. Robert King, *Design, Implementation and Evaluation of a Real-Time Kernel for Distributed Robotics*, December 1991. (Started as Research Scientist, IBM, Yorktown Heights, NY)

6. Patrice Brémond-Grégoire, *A Process Algebra of Communicating Shared Resources with DenseTime and Priorities*, May 1994. (Continue working at UNYSIS)

7. Hanêne Ben-Abdallah, *GCSR: a Graphical Language for the Specification, Refinement and Analysis of Real-Time Systems*, Aug 1996. (Co-supervised with Susan B. Davidson) (Started as Postdoc at the University of Waterloo, Professor at U. of Sfax, Tunisia)

8. Duncan Clarke, *Testing Real-Time Constraints*, Dec 1996. (Started as Assistant Professor, Department of Computer Science, The University of Kentucky, Lexington, KY)

9. Inhye Kang, *Real-Time System Analysis based on State-Space Exploration*, May 1997. (Started as Assistant Professor, Department of Computer Science, Soong-Sil University, Korea; Professor, University of Seoul, Korea)

10. Hee Hwan Kwak, *Process Algebraic Approach to the Parametric Analysis of Real-time Scheduling Problems*, Feb 2000. (Started as Senior R&D Engineer II, Synopsys, Portland, OR)

11. Mahesh Viswanathan, *Foundations for the Run-Time Analysis of Software Systems*, Sept 2000. (Co-supervised with Sampath Kannan) (Started as Postdoc at DIMACS, Assistant Professor, Department of Computer Science, University of Illinois at Urbana-Champaign) (Received the Morris and Dorothy Rubinoff Award for the best CIS Ph.D. dissertation, 2001)

12. Moonjoo Kim, *Information Extraction. for Run-time Formal Analysis*, Dec 2001. (Co-supervised with Sampath Kannan) (Started as Postdoc at POSTECH, Korea; Currently Assistant Professor at KAIST, Korea)

13. Jia Wang, *Loss-Sensitive Decision Rules for Intrusion Detection and Response*, July 2004. (Co-supervised with Linda Zhao, Statistics Department) (CEO, Venus Info Tech Inc., Beijing, P.R. China)

14. Insik Shin, *A Compositional Framework for Real-time Embedded Systems*, Aug 2006. (Started as Postdoc at Malardalen University, Sweden; Assistant Professor at KAIST, Korea) (Received the Morris and Dorothy Rubinoff Award for the best CIS Ph.D. dissertation, 2006)

15. Usa Sammapun, *Monitoring and Checking of Real-Time and Probabilistic Properties*, May 2007. (Co-supervised with Oleg Sokolsky) (Started as IT staff, Goldman Sachs; Kasetsart U., Thailand)

16. Michael May, *Privacy APIs: Formal Models For Analyzing Legal Privacy Requirements*, May 2008. (Co-supervised with Carl Gunter) (Development Manager, QIS, Ltd; Radio Adviser Contractor, Partner Communications, Limited; Faculty Lecturer, Kinneret College on the Sea of Galilee, Israel)

17. Madhukar Anand, *Conditional Models for Compositional Design of Real-Time Embedded Systems*, May 2008. (Cisco, Data Center Team)

18. Arvind Easwaran, *Advances in Hierarchical Real-Time Systems: Incrementality, Optimality, and Multiprocessor Clustering*, Dec 2008. (Co-supervised with Oleg Sokolsky) (Postdoc, IPP-HURRAY, Polytechnic Institute of Porto) (Research Scientist, Honeywell) (Assistant Professor, NTU, Singapore)

19. Nikhil Dinesh, *Regulatory Conformance: Logic and Logical Form*, Dec 2010. (Co-supervised with Aravind Joshi) (Researcher, SRI)

20. Jian Chang, *Behavior-Centric Trust Management in Distributed Systems*, May 2013. (Co-supervised with Sampath Kannan) (www.openx.com)

21. Andrew G. West, *Damage Detection and Mitigation in Open Collaboration Applications*, May 2013. (Co-supervised with Oleg Sokolsky) (Verisign)

22. Zhuoyao Zhang, *Performance Modeling and Resource Management for MapReduce Applications*, May 2014. (Co-supervised with Boon Tau Loo) (Google)

23. BaekGyu Kim, *Safety-Assured Model-Based Development of Real-Time Embedded Software for the GPCA Infusion Pump*, August 2015. (Co-supervised with Oleg Sokolsky) (Toyota ITC)

24. Andrew King, Foundations for Safety-Critical On-Demand Medical Systems, May 2016. (Zoox)

25. Bong Ho Kim, Techniques for End-To-End TCP Performance Enhancement over Wireless Networks, August 2016. (Working at Nokia, US)

26. Sanjian Chen, Model-Based Analysis of User Behaviors in Medical Cyber-Physical Systems, August 2016. (Applied Predictive Technologies (APT))

27. Alexander Roederer, Parameter Invariant Statistics and Their Application to Clinical Decision Support, Aug 2016. (Co-supervised with C. William Hanson III, MD) (Google)

28. Jaewoo Lee, Resource-Efficient Scheduling of Multiprocessor Mixed-Criticality Real-Time Systems, June 2017. (Co-supervised with Linh P.X. Phan) (Postdoc at Seoul National University (SNU), Assistant Professor at Choong-Ang University)

29. Radoslav Ivanov, Context-Aware Sensor Fusion for Securing Cyber-Physical Systems, July 2017. (Co-supervised with James Weimer) (Assistant Professor, RPI)

30. Junkil Park, Automatic Verification of Linear Controller Software, May 2017. (Co-supervised with Oleg Sokolsky) (Research Scientist, SGT/NASA Ames Research Center)

31. Meng Xu, Cache-Aware Real-Time Virtualization, June 2018. (Co-supervised with Linh P.X. Phan) (Apple)

32. David Arney, Medical Device Interoperability with Provable Safety Properties, May 2019. (Principal Associate, Harvard Medical School).

33. Sangdon Park, Uncertainty Estimation toward Safe AI, Aug 2021. (Co-supervised with Osbert Bastani) (Postdoc, Georgia Tech, Assistant Professor at Postech)

34. Tang Zhang, RV-enabled framework for self-adaptive software, Aug 2021. (Co-supervised with Oleg Sokolsky) (Facebook)

35. Ramneet Kaur, Screening Out-of-Distribution Inputs for Reliable AI Predictions, Dec 2023. (Co-supervised with Oleg Sokolsky) (SRI)

36. Matthew Cleaveland, Scalable and Risk Aware Verification of Autonomous Systems, May 2024. (Co-supervised with George Pappas) (Lincoln Lab)

37. Sydney Pugh, Weakly-Supervised Evaluation of Medical AI Systems, Aug 2024. (Co-supervised with James Weimer)

38. Xiayan Ji, Reliable Anomaly Detection with Explanation and Feedback, April 2025. (Co-supervised with Oleg Sokolsky) (Amazon AWS)

39. Kaustubh Sridhar, Training Adaptive and Sample-Efficient Autonomous Agents, April 2025. (Google DeepMind)

Master's Thesis Supervision

1. David M. Leonard, *Deterministic Multiple Processor Task Scheduling*, Dec. 1985.
2. Osvaldo M. Yasuda, *Remote Predicate Invocation in Prolog*, May 1987.
3. Robert King, *Design and Implementation of a Real-Time Distributed Kernel*, August 1987.
4. Hanene Ben-Abdallah, *Design and Implementation of UDP/IP for Timix*, May 1991.
5. Jisook Youn, *Methodology and Techniques for the Translation of SDL to ACSR*, May 1997.
6. Yoshihito Takashima, Towards Time and Value Determinism in Real-Time System with Virtual Machine, August 2006. (Co-advised with Sebastian Fischmeister)
7. Santosh G. Vattam, *Medical Device Dongle: An Open Source Standards-based Platform for Interoperable Medical Device Connectivity*, May 2012.
8. Cong Liao, *A Trust-Based Crowd-Sourcing Model for Information Evaluation in Vehicular Networks*, May 2013.
9. Meng Xu, *Overhead-Aware Compositional Scheduling Analysis of Real-Time Systems*, May 2013. (Co-advised with Linh Thi Xuan Phan)
10. Peter Gebhard, *System Support for Secure Updating of Consumer IoT Devices*, May 2017.
11. Yaser Abdulelah Alabdulbaqi, *Formal Models of Human-Computer Interactions: Lessons form Human Reliability Analysis Methods*, Systems Engineering, May 2017.

Senior Project Supervision

- Class of 1984 - Ned Batchelder, Michael S. Dusche, Elizabeth P. Gazouleas, Abigail Schweber
- Class of 1985 - Jerrol Davis, James C. Fu, Peter Go, Susanna Scala, Alan Waxman
- Class of 1986 - JoAnn Chang, Gaylord Holder, Shiu Kee Mok, Shin Ngai, John Rozario, Quang Tan, Khanh Tran
- Class of 1987 - Andrew Gideon, Vadim Mzhen
- Class of 1988 - Sung-Ho Ahn, Terence Lim
- Class of 1990 - Lalit Das, Manu Gambhir, Ronald Levinson
- Class of 1992 - Lawrence Katzman, Kok-Hoon Teo
- Class of 1995 - Ferit Albukrek, Alexander Gizis, Vicky Wei-Jen Lai, Ioi Kim Lam, Garrett Schade, John H. Seung
- Class of 1997 - Earl Grant-Lawrence Eugenia Ho, Chiram Littleton, David Robinson, Mike Selhorn, Adam Tarshis
- Class of 1998 - Sameer Merchant, Jeff Robertson, M. Ross, Andre Sung
- Class of 1999 - Charles Go

- Class of 2000 - Yuriko Horvath, Marvin Kawabata, Andrew Kim, David Kim, Cole Parker, Mike Rosenthal, Joel Susal (The senior design project by Kawabata, Susal, Parker, and Rosethal placed the 1st in the SEAS senior design competition.)
- Class of 2001 - Eric R Brueggemann, Daniel Chang, Dan Fleisher, Munenari Fukuda, Ethan D Gur-Esh, Jason W Heckathorn, Jisen Ho, Jay A Kalyanaraman, Alex Koo, Jonathan Liang, Sudeep Mathur, Christopher Ngan, Kevin O'Brien, Usa Sammapun, John A. Sinclair, Kavitha Shastry, Sam M. Sokolovsky, Robert Spier, Raymond Wong, Daniel A. Wu
- Class of 2003 - Jennifer R. Gau, Fei Jin, Uri Korn, Litton Chen (EE), Dan Keeley (EE), Jonathan Ha (EE), Sangyop Lee (EE)
- Class of 2004 - Yongjoon P. Lee, Khurram Taji
- Class of 2005 - Yoshihito Takashima, Mike Benoit (EE), Mike Swavola (EE)
- Class of 2010 - Ana Rosa Giannareas, Vanessa Kern, Nicholas Stevens, Adrian Viesca-Trevino (ESE) (Their senior design project on "Smart Alarms" placed the 1st in the SEAS senior design competition. This team is called NAVA.)
- Class of 2011 - Avantika Agrawal, Phillip Baker, Brittney Exline
- Class of 2013 - Benjamin Perez, Chris Feo; Preetam D'Souza, Max Guo, David Wang
- Class of 2014 - Mingzhe Lin, Deepthi Shashidhar
- Class of 2017 - Jae Joon Lee, Spiro Metaxas, Chad Nachiappan, Vivek A. Raj
- Class of 2018 - Yuting Yue (Summer, EAS499)
- Class of 2019 - Antonio Menarde (SYS), James Taggart (CSCI), Monica Vyavahare (CSCI), Stephanie Tang (CMPE), and Tristrum Tuttle (CSCI)
- Class of 2020 - Walter Chen (CSCI), Ria Nagar (SYS), Bill Lou (CSCI), Howard Yuan (SYS);
- CIS498: Senior Thesis, Yiwei Chen. Study of Route Optimization Algorithms, Improvements with Metaheuristics and Machine-learning Models, and an Industrial Case Study with AmeriGas. Spring 2022

Summer Interns (from 2018)

- 2018: Mark Choi, Michael Cipolla (PURM), Aditya Hota (PURM), Hyung Ji Jung (PURM), Justin Swirbul (PURM)
- 2019: Ben Chrepta, Joy Leeswadtrakul (PURM), Aditya Hota (Rachleff Scholar), Sewon Park (Rachleff Scholar), Margaret Steiner (George Washington University), Alexander Wang (PURM)
- 2020: Alan Ismaiel (PURM), Jason Shu (PURM)
- 2021: Ryan Tong (PURM), Sriram Tolety (PURM), Jack Zhang (PURM)

Selected External Habilitation and Ph.D. Committees

- External Committee Member, PhD Dissertation by Esen Yel, "Online Predictive Monitoring and Planning for Safe Autonomous Robotic Systems," University of Virginia, Aug 2021.
- External Committee Member, PhD Dissertation by Vuk Lesi, Department of Electrical and Computer Engineering, "Design of Secure and Safe Cyber-Physical Systems," Duke University, Aug 2019.

- External Committee Member, PhD Dissertation by Sisu Xi, Computer Science and Engineering, "Real-Time Virtualization and Cloud Computing," Washington University, St. Louis, Aug 2014.
- External Examiner, Ph.D. Dissertation by Silviu Craciunas, Department of Computer Sciences, "Programmable Temporal Isolation for High-Performance and Real-Time Systems," University of Salzburg, Austria, July 2010.
- External Examiner, Ph.D. Dissertation in Computing and Software by Xia Yong Hu, "Proving Implementability of Timing Properties with Tolerances," McMaster University, Canada, Aug 11, 2008.
- Opponent, Ph.D. Dissertation by Daniel Sundmark, "Structural System-Level Testing of Embedded Real-Time System", Maalardalen University, Sweden, Feb 15, 2008.
- Kerncommissie of Ph.D. Dissertation by Pieter Jan Laurens Cuijpers "Hybrid Process Algebra," Techische Universiteit Eindhoven, Dec 9, 2004.
- Jury Member of Habilitation Thesis by Sergio Yovine, "Models, Algorithms, and Logics for the Analysis of Real-time and Hybrid Systems (Modèles, Algorithmes et Logiciels pour L'Analyse de Systèmes Temporisés et Hybrides)," University of Joseph Fourier, Grenoble, France, September 2001.
- Committee member of Ph.D. Dissertation by Gregor Goessler, "Compositional Modeling of Real-time Systems - Theory and Practice," University of Joseph Fourier, Grenoble, France, September 2001.

Postdoctoral Fellows and Research Associates

1. Dr. Jin-Young Choi, Postdoc (1993-1995) (Assistant Professor, Korea University)
2. Dr. Anna Philippou, Postdoc (Mar 1997 - Aug 1998) (Assistant Professor, University of Cyprus)
3. Dr. Oleg Sokolsky, Research Associate (Sep 1998 - June 2001)
4. Dr. Jitka Stribrna, Postdoc (Sep 2000 - Aug 2001)
5. Dr. Hyoung Seok Hong, Postdoc (Sep 2000 - Feb 2002), Research Associate. (Mar 2003 - Feb 2004)
6. Dr. Na Young Lee, Postdoc (Nov 2001 - Oct 2002)
7. Dr. Martin Leucker, Postdoc (Jan 2002 - Mar 2002)
8. Dr. Jesung Kim, Postdoc/Research Associate (April 2002 - Sep 2005) (Research Scientist, Matworks)
9. Dr. Li Tan, Postdoc (July 2002 - Dec 2003) (Research Scientist, Matworks; Assistant Professor, Washington State University Tri-Cities)
10. Dr. Sebastian Fischmeister, Research Associate, (Feb 2005 - Jan 2008) (Assistant Professor, University of Waterloo)
11. Dr. Vinayak Prabhu, Postdoc (July 2008 - Aug 2009)
12. Linh Thi Xuan Phan, Postdoc (March 2009 - June 2012) (Research Assistant Professor, University of Pennsylvania)
13. Dr. Eunkyoung Jee, Postdoc (Sept 2009 - Jan 2011) (Research Assistant Professor, KAIST)
14. Dr. Krishna Venkatasubramanian (Sept 2009 - Aug 2012) (Assistant Professor, Worcester Polytechnic Institute)
15. Dr. Anaheed Zaki (March 2011 - Dec 2013) (Research Scientist, Mathworks)

16. Dr. Miroslav Pajic (Sept 2012 - June 2015) (Assistant Professor, Duke)
17. Dr. Nicola Bezzo (Nov 2012 - Dec 2015) (Assistant Professor, UVA, Jan 2016)
18. Dr. James Weimer (Nov 2012 - July 2016) (Research Assistant Professor, UPenn, Aug 2016)
19. Dr. Lu Feng (James S. McDonnell Fellow (April 2013 - Dec 2016) (Assistant Professor, UVA, Jan 2017)
20. Dr. Deepak Gangadharan (March 2015 - Aug 2019) (Assistant Professor at IIIT Hyderabad, Sept 2019)
21. Dr. Jin Hyun Kim (Dec 2015 - Feb 2019) (Assistant Professor, Gyung Sang University, Korea)
22. Dr. Hyon Young Choi (April 2016 - present)
23. Dr. Hyojin Jo (May 2016 - August 2018) (Assistant Professor, Hallym University, Korea)
24. Dr. Fanxin Kong (March 2017 - July 2018)(Assistant Professor, Syracuse University)
25. Dr. Nima Roohi (July 2017 - June 2018) (Postdoc fellow, UCSD)
26. Dr. Yiannis Kantaros (August 2018 - Dec 2021) (Assistant Professor, University of Washington at St. Louis)
27. Dr. Xian (Shawn) Li (November 2019 - Oct 2022)
28. Dr. Ivan Ruchkin (Dec 2019 - Dec 2022) (Assistant Professor, University of Florida at Gainesville)
29. Dr. Souradeep Dutta (July 2020 - July 2024) (Assistant Professor, University of British Columbia)
30. Dr. Amanda Watson (August 2020 - July 2023) (Assistant Professor, UVA)
31. Dr. Michele Caprio (June 2022 - May 2024) (Assistant Professor, University of Manchester, UK)
32. Dr. Kuk Jang (Jan 2022 - present)
33. Dr. Lin Zhang (Sep 2023 - Dec 2024) (GenAI Data Scientist, Eli Lilly and Company)

Visiting Fellows

- Prof. Jin-Taek Choi, Department of Computer Science, Incheon University, Incheon, Korea (1993)
- Prof. Soonyong Seong, Department of Computer Engineering, Pusan University of Foreign Studies, Pusan, Korea (1995)
- Prof. Youngho Kim, Computer Science Department, Communication & Architecture Laboratory, Pusan National University, Pusan, Korea (1995)
- Dr. Young Si Kim, Software Engineering Department, ETRI (Electronics and Telecommunications Research Institute), Taejon, Korea (1995 - 1996)
- Dr. Vijay Gehlot, Visiting Postdoc (1995-1996)
- Prof. Soon Ju Kang, School of EECS, Kyungpook National University, Deague, Korea (May 2000 - May 2002, Feb 2007 - Feb 2008)
- Prof. Jin-Young Choi, Department of Computer Science and Engineering, Korea University, Seoul, Korea (Sep 2002 - Aug 2003, Aug 2009 - Aug 2010)
- Prof. Moon-kun Lee, Department of Computer Science, Chon-buk National University, Chon-buk, Chon-ju City, Korea. (Jan 2003 - May 2004)

- Prof. Chang Byung-Mo, Department of Computer Science, Sookmyung Women's University, Seoul, Korea (Mar 2003 - Aug 2003)
- Prof. Myuhng-Joo Kim, Department of Information Security Engineering, Seoul Women's University, Seoul, Korea (Mar 2003 - Feb 2004)
- Prof. NakUn Seong, Department of Computer Science, Kyungsung University, Busan, Korea (Mar 2004 - Feb 2005)
- Prof. Hyeokman Kim, Department of Computer Science, Kookmin University, Seoul, Korea (Jan 2005 - Dec 2005)
- Prof. Woojin Lee, School of EECS, Kyungpook National University, Deague, Korea (Jan 2005 - Dec 2005)
- Dr. Jang Yeol Kim, KAERI (Korea Atomic Energy Research Institute), Korea (Sept 2007-Aug 2008)
- Prof. Yoon Joon Lee, Department of Computer Science, KAIST, Korea (Sept 2007-Feb 2008)
- Dr. Jeong Nyeo Kim, ETRI, Korea (Feb 2009 - Feb 2010)
- Yun Kyung Park, ETRI, Korea (June 2009 - June 2010)
- Prof. Young Woong Ko, Department of Computer Engineering, Hallym University, Chuncheon, Korea (July 2009 - July 2010)
- Prof. Myuhng-Joo Kim, Department of Information Security Engineering, Seoul Women's University, Seoul, Korea (Aug 2010 - July 2011)
- Dr. Poalo Masci, Queen Mary University of London (Oct 2012 - Nov 2012)
- Jeonghwan Ryu, Visiting Student, Korea University (Sep 2012 - Jan 2013)
- Dr. Chang Joon Park, ETRI, Korea (Aug 2012 - July 2013)
- Kieu My Phan, Visiting Student, KAIST, Korea (Sept 2013 - Feb 2015)
- Dr. Liang Cheng, Institute of Software, Chinese Academy of Sciences, Beijing, China (Jan 2014 - Dec 2015)
- Dr. Hyon Young Choi, Korea University (April 2014 - March 2016)
- Prof. Kyong Hoon Kim, Gyeongsang National University (GNU), Korea (Jan 2017 - Jan 2018)
- Prof. Kyungtae Kang, Hanyang University, Korea (Feb 2017 - Feb 2018)
- Dr. Alberto Huertas, Univeristy of Murcia, Spain (Oct 2017 - Feb 2018)
- Dr. Suk-Bok Lee, Hanyang University, Korea (Aug 2019 - Aug 2020)
- Prof. Kyung-Joon Park, DGIST, Korea (Aug 2021 - July 2022)

Selected Invited Talks and Lectures since 2001

1. Resilient Social CPS: Challenged and Opportunities. Keynote Talk. NSF-JST Workshop, Osaka, Japan, 2 July 2024.
2. Towards High-Assurance Learning-Enabled CPS. Invited Talk. IEEE SmartComp, 30 June 2024.

3. Building the CPS Community: My Personal Journey. Award Banquet Talk. CPS-IoT Week. 15 May 2024.

4. Towards High-Assurance Learning-Enabled Cyber-Physical Systems. ACM SIGBED Distinguished Lecture, 21 Feb 2024.

5. Toward Assured Autonomous Medical Cyber-Physical Systems. Keynote Talk. IEEE/ACM CHASE, 17 Nov 2022.

6. Toward Assured Autonomous Medical Systems, Perelman School of Medicine (PSOM), University of Pennsylvania, Oct 17, 2022.

7. ARO MURI: Robust Concept Learning and Lifelong Adaptation Against Adversarial Attacks. OSDR&E MURI Program Review, 13 July 2022.

8. Toward Medical Autonomous Systems based on the Internet of Medical Things. KyungPook National University, June 13, 2022.

9. Assuring Confidence in AI-Based Autonomous Cyber-Physical Systems. Keynote Talk. International Workshop on AI Convergence Engineering, Gyeongsang National University (GNU), Korea, Jan 26, 2022

10. High-Assurance Autonomous Cyber-Physical Systems with Learning-Enabled Components. Invited Talk. Cyber CoI Working Group Meeting, OUSD (R&E), Dec 8, 2021.

11. High-Assurance Autonomous Cyber-Physical Systems with Learning-Enabled Components. Keynote Talk. Winter Conference, Computer Systems Society of Korean Information Science Society, Feb 2, 2021.

12. Toward Secure and Safe Learning-Enabled Autonomous Cyber-Physical Systems. Distinguished Seminar, Temple University, Feb 21, 2020.

13. Toward Secure and Safe Learning-Enabled Autonomous Cyber-Physical Systems. KAIST, Korea, Nov 4, 2019.

14. Internet of Medical Things and Computing for Health: Challenges, Trends, and Opportunities. Keynote Talk. iLDi International Symposium, Osaka, Japan, Nov 1, 2019.

15. The Internet of Medical Things: Personalizing Medicine in an Impersonal World, Keynote Talk, IEEE ISORC, Valencia, May 7, 2019.

16. The Internet of Medical Things: Personalizing Medicine in an Impersonal World, Perelman School of Medicine, University of Pennsylvania, Jan 17, 2019

17. Internet of Medical Things and Medical Cyber-Physical Systems: Challenges and Opportunities, CSE Department and I-CPIE seminar, Lehigh University, Dec 14, 2018.

18. Security of Cyber-Physical Systems: Challenges and Approaches, Keynote Talk, HoTSoS, April 4, 2017.

19. The Internet of Medical Things to Enable Medical Cyber-physical Systems, Distinguished Talk, EECS Colloquium, University of California at Irvine, Jan 13, 2017

20. The Internet of Medical Things to Enable Medical Cyber-Physical Systems, Distinguished Talk, William & Mary University, Nov 11, 2016.

21. Cyber-Physical Systems: Security and Privacy Challenges and Approaches, ETRI, Korea, Aug 22, 2016.

22. Platform-Based Automotive Safety Features: Research Challenges and Directions, Invited Talk, Int. Workshop on CPS, DIGST, Aug 16, 2016.

23. Internet of Medical Things to Enable Medical Cyber-Physical Systems. Keynote Talk, IEEE Conf. on Connected Health: Applications, Systems and Engineering Technology (CHASE), Washington, D.C., June 28, 2016.

24. Trust Management for Cyber-Physical Systems. Invited Talk, Social Trust in Autonomous Robots, RSS2016 Workshop, Ann Arbor, June 19, 2016.

25. Smart Medical Cyber-Physical Systems: Challenges and Directions. 2.5 Hour Tutorial, Smart Health Systems Workshop, Seoul, June 15, 2016.

26. Cyber-Physical Systems: Security and Privacy Challenges and Approaches. Invited Talk, Korea University, June 10, 2016.

27. Assuring Safety of Medical Cyber-Physical Systems, Invited Talk, Oxford University, May 20, 2016.

28. Toward Plug & Play Medical Cyber-Physical Systems, 3 hour tutorial, EMSIG School Denmark, Nov 10, 2015.

29. Parameter-Invariant Monitor Design for Cyber-Physical Systems. James Weimer, Oleg Sokolsky, Insup Lee. 3 Hour Tutorial at ESWeek, Oct 2015.

30. Towards a Logical Foundation for Assurance Arguments for Plug & Play Systems, Invited talk, VeriSure: Verification and Assurance Workshop, San Francisco, July 18, 2015.

31. Medical Cyber-Physical Systems for 21st Century Health Care, Keynote talk, KSEA NRC & KASBP Spring Symposium, Edison, NJ, June 12, 2015.

32. Attack-Resilient State Estimator and Sensor Fusion for CPS Security, Invited talk, Korea University, June 9, 2015.

33. Medical Application Platforms for On-Demand Medical Cyber-Physical Systems, Int. Workshop on CPS, DGIST, June 3, 2015.

34. Medication Application Platforms for On-Demand Medical Cyber-Physical Systems Keynote Talk, APRES Workshop, April 13, 2015

35. Compositional Scheduling and Real-Time Virtualization, Keynote Talk, Summer Embedded Technology Summit, Jeju, Korea, July 11, 2014.

36. Closing the Loop in Medical Cyber-Physical Systems: Safety Challenges, Distinguished Lecture, International Workshop on Cyber-Physical Systems, Seoul, July 9, 2014.

37. Assurance Cases for Life-Critical Cyber-Physical Systems, Tutorial, International Workshop on Cyber-Physical Systems, Seoul, July 8, 2014.

38. Closing the Loop in Medical Cyber-Physical Systems: Safety Challenges, Invited talk, Dr. M Project, KAIST, July 4, 2014.

39. Assuring the Safety of Closed-Loop Medical Systems, Keynote Talk, 2nd Smart Medical Information and Security Conference, Seoul, July 1, 2014.

40. Model-Based Development of Embedded Systems, Invited Seminar, Industrial Technology Institute, Samsung Electronics, Korea, June 30, 2014.

41. Assuring the Safety, Security, and Reliability of Medical Cyber-Physical Systems (MCPS), Neurosurgery Grand Rounds, SoM/UPHS, Philadelphia, March 27, 2014

42. Assurance Cases for Medical Devices, Keynote talk, Secure Software Research Center (SSRC) Workshop, Seoul, Nov 22, 2013.

43. Assuring the Safety and Security of Medical Cyber-Physical Systems, Plenary talk, Secure Software Research Center (SSRC) Opening Day, Korea University, Nov 19, 2013.

44. Compositional Schedulability Analysis and Real-Time Virtualization, Invited Talk, Symposium on Computer and Information Science, KSEA UKC2013, East Rutherford, NJ, Aug 9-10, 2013.

45. Challenges, Opportunities and Research Directions of Medical Cyber-Physical Systems, Universal Linkage for Top Research Advisor Program (ULTRA) Forum, Aug 9, 2013.

46. "Assuring the Safety of Medical Cyber-Physical Systems (MCPS)," Keynote talk, CSOS R&D Workshop, Kyungpook National University, Daegu, Korea, July 19, 2013.

47. "Assuring the Safety, Security, and Reliability of Medical Cyber-Physical Systems," Computer Science Distinguished Lecturer Series, Wayne State University, March 26, 2013.

48. "Assuring the Safety, Security, and Reliability of Medical-Device Cyber-Physical Systems (MDCPS)," Triangle Computer Science Distinguished Lecturer Series, Feb 25, 2013.

49. Invited Lecture, "Challenges and Research Directions in Medical Cyber-Physical Systems," NanoTera/ARTIST Summers School on Embedded Systems Design 2012 Aix les Bains, France, September 21, 2012

50. Keynote talk, "Challenges and Research Directions in Medical Cyber-Physical Systems," Workshop on Cyber-Physical Systems, DGIST at Tague, Aug 23, 2012.

51. Keynote talk, "Challenges and Research Directions in Medical Cyber-Physical Systems," Workshop on Cyber-Physical Systems, Networks, and Applications (CPSNA), Seoul, Aug 19, 2012.

52. Invited talk, "Assurance cases for Generic PCA reference implementation and beyond." IFIP Working Group 10.4 (Dependable Computing and Fault Tolerance), June 28-July 1, 2012.

53. Keynote Talk, "Challenges in Medical-Device Cyber-Physical Systems," Workshop on Open Resilient human-aware Cyber-Physical Systems (WORCS-2012), June 25, 2012

54. Distinguished Lecture, "Challenges and Research Directions in Medical Cyber-Physical Systems," DTC Science and Technology Innovators Series, University of Minnesota, May 1, 2012.

55. Tutorial, "Compositional Analysis of Cyber-Physical Systems," Linh T.X. Phan, Insup Lee, Oleg Sokolsky, Insik Shin, CPS Week, April 16, 2012.

56. FKII (The Federation of Korean Information Industries) mini-course, "Embedded Software for Life-Critical Application," Seoul, Feb 6-10, 2012.

57. Keynote talk, "Challenges and Research Directions in Medical Cyber Physical Systems," KOCSEA Symposium, San Jose, Dec 17, 2011.

58. Tutorial, "Compositional Analysis of Real-Time Embedded Systems", Linh T.X. Phan, Insup Lee, Oleg Sokolsky, Embedded Systems Week, Taipei, Oct 9, 2011.

59. Invited talk, "Medical Cyber-Physical Systems," 1st EU-US Workshop on Networked Monitoring & Control/CPS, Brussels, Belgium, June 28, 2011.

60. Plenary talk, "Cyber Physical Systems: 21st Century Embedded Systems," ISET 2011, Jeju, South Korea, to be give on May 20, 2011.

61. Keynote talk, "Compositional scheduling and analysis techniques for real-time embedded systems," CPS Day @DGIST, Deagu, South Korea, to be given on May 19, 2011.

62. Distinguished Lecture, "Medical Cyber Physical Systems," Department of Computer Science, Washington University, Dec 10, 2010.

63. "Computer and Internet: Past, Current, and Future," Korean-American Women's Association in Philadelphia (KAWAP), September 19, 2010.

64. Keynote talk, "Cyber Physical Systems: The Next Computing Revolution," ACACES International Summer School, La Mola, Spain, July 11, 2010. (http://www.hipeac.net/summerschool/)

65. "Medical Cyber Physical Systems," Special Session on CPS, DAC 2010, June 17, 2010.

66. Keynote talk, "Cyber Physical Systems," Cornerstone Ceremony, ADREAM, LAAS-CNRS, Toulouse, France, June 15, 2010. (http://www.laas.fr/ADREAM)

67. "Real-Time Challenges and Opportunities in HCMDSS," RTSS 09 Banquet talk, Dec 2, 2009.

68. "High-Confidence Medical Device Systems and Healthcare Systems," Inter. Workshop on Cyber-Physical Systems (WCPS'09): Closing the Loop, in Conjunction with ESWeek 2009, Oct 16, 2009.

69. "Cyber Physical Systems: The Next Computing Revolution," SNU, Korea, Sept 1, 2009.

70. "Cyber Physical Systems: The Next Computing Revolution," KAIST, Korea, Aug 31, 2009.

71. "Cyber Physical Systems: The Next Computing Revolution," Keynote Talk, UCK IST, Raleigh, July 18, 2009.

72. Invited Panelist in NITRD Strategic Forum, Federal Strategic Plan for the Networking and Information Technology Research and Development Program, DC, Feb 24-26, 2009.
(webcast at http://www.tvworldwide.com/events/nitrd/090225/)

73. "Compositional Schedulability Analysis," McGill University, Oct 3, 2008.

74. "Cyber Physical Systems: The Next Computing Revolution," KIST (Korea Institute of Science and Technology), Korea, June 16, 2008.

75. "High-Confidence Automotive Cyber Phsyical Systems and Related Research at Penn," Hyundai Autonet, Korea, June 10, 2008.

76. "Cyber Phsyical Systems and Related Research at Penn," Invited Talk, ETRI, Korea, June 9, 2008.

77. "Compositional Schedulability Analysis and Cyber Physical Systems," Kyungpook National University, Korea, June 5, 2008.

78. "High-Confidence Medical Device Software and Systems: Trends, Challenges, and Opportunities," Invited Technical Talk, 10th Software Design for Medical Devices, Philadelphia, PA, May 15, 2008.

79. "Compositional Schedulability Analysis," Keynote talk, ITRC Meeting, Jeju Island, April 10, 2008.

80. "Compositional Schedulability Analysis and Cyber Physical Systems," KAIST, Korea, April 7, 2008.

81. "Cyber Physical Systems: The Next Computing Revolution," Sunmoon University, Korea, March 18, 2008.

82. "Compositional Schedulability Analysis: Challenges, Techniques, and Open Problems," Maalardalen University, Sweden, Feb 15, 2008.

83. "Network and Information Technology R&D in US," Department of Information and Communication of Korea, Nov 20, 2007.

84. "Compositional Analysis Techniques for Real-Time Embedded Systems," SNU, Nov 19, 2007.

85. "CPS: Cyber Physical Systems," Keynote talk, Workshop on Embedded Software in Non-IT Industry Seoul, Korea November 16, 2007

86. "High Confidence Medical-Device Software and Systems (HCMDSS): A CPS Application Domain," NSF Symposium on Cyber-Enabled Discovery and Innovation, RPI, Troy, NY, Sep 6, 2007.

87. "Compositional Techniques for Real-Time Embedded Systems," Keynote Talk, UKC 2007, Aug 2007.

88. "Model-Based Techniques for Validating Implementations," Drexel University, Jan 25, 2007.

89. "Opportunities and Challenges of Cyber Physical Systems (CPS), KOCSEA Workshop, Dec 2006.

90. "High Confidence Software and Systems: A Software Perspective," PCAST NIT Subcommittee Meeting, Aug 30, 2006.

91. "Model-Based Techniques for Validating Implementations," IEEE Montreal Chapter, McGill University, May 11, 2006.

92. "Model-based Techniques for Real-Time Embedded Systems," KAIST, April 27, 2006.

93. "Model-Based Techniques for Validating Implementations," Princeton University, April 14, 2006.

94. "Model-Based Techniques for Validating Implementations," University of Alabama-Birmingham, March 8, 2006.

95. "Model-based Development of Embedded Software," IEEE North Jersey Computer Chapter, Aug 2, 2005.

96. "Ubiquitous Realization: Challenges and Opportunities for Embedded Systems," Samsung SDS Thought Leadership Conference 2005, Keynote talk, April 13, 2005.

97. "Run-time verification and its application to IDS," Invited talk, Mini Sympoisium on Information Security, Northeastern University, Nov 9, 2004.

98. "Compositional Periodic Interface for Real-Time Components," Invited talk, Workshop on Software Engineering Tools: Compatibility and Integration, The Monterey Workshop Series, Vienna, Oct 4-6, 2004.

99. "Bridging the Gap between Specification and Implementation," Kunkook University, Korea, July 13, 2004.

100. "Model-based Development of Embedded Software," EECS, Kyungpook Natioinal University, Korea, July 8, 2004.

101. Moderator, Penel on "Major Push Needed in Distributed Real-Time Computing Research," ISORC, Vienna, May 14, 2004.

102. "A Compositional Framework for Real-Time Gurantees," Future Generation Software Architectures in the Automotive Domain: Connected Services in Mobile Networks, Workshop, San Diego, Jan 10-12, 2004.

103. "Model-Based Techniques for Validating Implementations at Run Time and Design Time," Drexel Univeristy, Nov 12, 2003.

104. "Checking Conformance to Component Interface Specification," Next TTA Workshop, Philadelphia, Oct 2003

105. "Formal Methods for Schedulability and Performance Analysis of Real-Time and Embedded Systems," one-day lecture at European Summer School on Embedded Systems 2003 in Vaseras, Oct 3, 2003.

106. Panelist, "Future Challenges and Advances in Real-Time Computing," RTAS, D.C., June, 2003.

107. "Formal Methods for CARA Development," FDA, Nov 2002.

108. Panelist, Next TTA Workshop, Grenoble, Oct, 2002.

109. "Model-Based Validation of Software," New Information Technology Age: The KSEA North-East Workshop & Special Event (NEWS 2002), Ocean City, MD, May 3-5, 2002.

110. "Specification-Based Techniques for Validating Programs at Run Time and Design Time," Villanova University, April 22, 2002.

111. Half-day tutorial on "Formal Methods for Timing and Schedlability Analysis of Embedded Systems," during ETAP '02, Grenoble, France, April 2002.

112. "Formal Methods for CARA Development," WRAIR, Nov 2001.

113. "Run-time Monitoring and Checking of Java Programs," ETRI, Aug 2001

114. "A Family of Resource-Bound Real-time Process Algebras," KAIST, Aug 2001

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3. Out-of-Distribution Detection in Dependent Data for Cyber-Physical Systems with Conformal Guarantees, Ramneet Kaur,Yahan Yang, Oleg Sokolsky, Insup Lee. ACM Trans. on CPS, 8(4), 2024.

4. Memory-based Distribution Shift Detection for Learning Enabled Cyber-Physical Systems with Statistical Guarantees. Yahan Yang, Ramneet Kaur, Souradeep Dutta, Insup Lee. ACM Transactions on Cyber-Physical Systems, Volume 8 Issue 2, 2024.

5. Automated insulin delivery for hypoglycemia avoidance and glucose counterregulation in long-standing type 1 diabetes with hypoglycemia unawareness. Anneliese J Flatt, Amy J Peleckis, Cornelia Dalton-Bakes, Huong-Lan Nguyen, Sarah Ilany, Austin Matus, Susan K Malone, Namni Goel, Sooyong Jang, James Weimer, Insup Lee, Michael R Rickels. Diabetes Technology & Therapeutics, 2023/2024.

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9. Characterizing Glycemic Control and Sleep in Adults with Long-Standing Type 1 Diabetes and Hypoglycemia Unawareness Initiating Hybrid Closed Loop Insulin Delivery. Malone, Susan Kohl, Amy J. Peleckis, Laura Grunin, Gary Yu, Sooyong Jang, James Weimer, Insup Lee, Michael R. Rickels, and Namni Goel. Journal of Diabetes Research 2021 (2021).

10. Verifying the Safety of Autonomous Systems with Neural Network Controllers. Radoslav Ivanov, Taylor J. Carpenter, James Weimer, Rajeev Alur, George J. Pappas, Insup Lee ACM Transactions on Embedded Computing Systems (TECS), 20 (1), 2020:1-26. (ACM TECS Best Award 2022)

11. Assured Run-time Monitoring and Planning: Towards Verification of Neural Networks for Safe Autonomous Operations. Esen Yel, Taylor Carpenter, Carmelo Di Franco, Radoslav Ivanov, Yiannis Kantaros, Insup Lee, James Weimer, Nicola Bezzo. IEEE Robotics and Automation Magazine, June 2020.

12. Ivan Ruchkin, Oleg Sokolsky, James Weimer, Tushar Hedaoo, Insup Lee. Compositional Probabilistic Analysis of Temporal Properties Over Stochastic Detectors. IEEE Transactions on Computer-Aided Design of Integrated Circuits and Systems, 2020.

13. MAuth-CAN: Masquerade-Attack-Proof Authentication for In-Vehicle Networks. Hyo Jin Jo, Jin Hyun Kim, Hyon-Young Choi, Wonsuk Choi, Dong Hoon Lee, and Insup Lee. IEEE Intelligent Transportation Systems Transactions. 69(2), 2204-2218, Feb 2020.

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38. Analyzing and Defending Against Web-based Malware. Jian Chang, Krishna K. Venkatasubramanian, Andrew G. West, Insup Lee. ACM Computing Survey, 45(4): 49:1-49:35, August 2013.

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45. "Limitations of Threshold-Based Brain Oxygen Monitoring for Seizure Detection," Soojin Park M.D., Alexander Roederer, Ram Mani M.D., Sarah Schmitt M.D., Peter LeRoux M.D., Lyle Ungar Ph.D., Insup Lee Ph.D., Scott Kasner M.D. NEUROCRITICAL CARE: Volume 15, Issue 3 (2011), Page 469-476.

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- GIP (General Infusion Pump) project (http://rtg.cis.upenn.edu/gip.php3) is listed in the FDA infusion pump improvement initiative, April 23, 2010. (http://www.fda.gov/MedicalDevices/ProductsandMedicalProcedures/GeneralHospitalDevicesandSupplies/InfusionPumps/default.htm)
- Korean On-Line News Interview, Aug 2005. (http://www.hellodd.com/Kr/DD_News/Article_View.asp?Mark=12987)
- "New $2.84 Millon Grant Supports Efforts to Improve Reliability of Computers Embedded in Electroni Devices," Penn News, Oct 26, 2001.
- "NSF Awards Penn Scientists $1 Million to Identify Better, Earlier Means of 'Debugging' Embedded Computers," Penn News, Aug 22, 2001.
- "Engineering research team receives $2 million grant," The Daily Pennsylvania, Sept 13, 2000.
- "Penn Researchers win 2.2 Million for Efforts to Boost Reliability of Computers Embedded in Devices of All Types," Penn News, Aug 21, 2000.

- "Improving Computer Reliability: Penn profs study mini processors," Philadelphia Daily News, Sept 11, 2000.

Research Grants (Current)

- Penn4C grant, Designing technology for social justice & health Faculty & Community-Partnered Pilot Grant Program Sponsored by Penn Nursing & Penn Engineering. Insup Lee (PI), Oleg Sokolsky. 8/24-12/25, $20K. (Collaborative Project with Penn Nursing and Connectedly)

- NIH 1R01EY037101-01, SCH: Robust and Equitable Clinical Decision Support in Glaucoma Detection and Progression Prediction. Insup Lee (PI), Osbert Bastani, Oleg Sokolsky, Lama Al-Aswad (Penn Medicine). 8/24-7/28, $1,190K.

- NSF 2143274, Collaborative Research: CPS: Medium: Sensor Attack Detection and Recovery in Cyber-Physical Systems. Insup Lee (PI), Oleg Sokolsky. 7/22-7/25 $690K. (Collaborative Project with Syracuse University, PI: Fanxing Kong)

- NSF 2125561, SCC-IRG JST: Active sensing and personalized interventions for pandemic-induced social isolation. Insup Lee (PI), Oleg Sokolsky, James Weimer, George Demiris (School of Nursing), 10/21-9/24, $750K. (Collaborative Project with Osaka University, funded by JST, PI: Teruo Higashino) Supplementary Fudning, 10/24-9/25 $150K.

- ARO W911NF2010080, MURI, Robust Concept Learning and Lifelong Adaptation Against Adversarial Attacks. Insup Lee (PI), Osbert Bastani, Kostas Daniilidis, Eric Eaton, Dan Roth, James Weimer (University of Pennsylvania), and Julia Parish-Morris (Children's Hospital of Philadelphia). 4/20-7/25, $6.25M.

Research and Education Grants (Completed)

- NSF 1915398, SCH: INT: Collaborative Research: Smart Alarms 2.0: Foundations for Caregiver-in-the-loop Suppression of Non-Informative Alarms. Insup Lee (PI), James Weimer. 8/15/19-7/31/24, $980K. (CHOP, Christopher Bonafide (PI), Sara Demauro, James Wong, $217K.)

- NIH, R01EB029363, SCH: Monitoring safety and adherence of pain management though remote opioid. Insup Lee, Ping Wang, James E Weimer (contact), Shu Yang. 9/19-6/23, $905K.

- ONR N00014-20-1-2744 Guaranteeing Data Freshness in Distributed Real-Time Systems Insup Lee (PI), Linh Phan, Oleg Sokolsky 11/1/19-10/31/22, $900K

- NIH, R01EB029767, CPS: AutoWean: Foundations of Autonomous Medical CPS for Mechanical Ventilation Weaning. Insup Lee (contact), Barry Fuchs, Oleg Sokolsky, James Weimer. 9/19-7/22, $1.1M.

- NIH R18, Pediatric patient safety learning laboratory to re-engineer continuous physiologic monitoring systems. Christopher Bonafide (PI), James Won, Sara DeMauro, Insup Lee, Sarah Rottenburgh, James Weimer. $190K, 10/18-10/22.

- Towards Improving Glycemic Control through Behavioral Feedback in Type 1 Diabetes, Pennsylvania Tobacco Fund. Insup Lee (PI), Shivani Agarwal, Michael Rickels, James Weimer. $200K, 9/18-8/22.

- DARPA Assured Autonomy, Integrated Static and Dynamic Approaches to High-Assurance for Learning-Enabled Cyber-Physical Systems. I. Lee (PI), R. Alur, D. Lee, M. Morari, G. Pappas, O. Sokolsky, James Weimer, Nicola Bezzo (UVA). 4/18-4/22, $4.8 M.

- ONR, ASPIRE: Automatically Subsetting Protocol Implementations Reliably and Efficiently. Mayer Naik (PI), R. Alur, I. Lee, Boon Lou, Sokolsky. 1/11/18-12/31/22, $6.1M

- SRC, Anomaly Detection for Safe Autonomy, Insup Lee (PI), Oleg Sokolsky, James Weimer. $280K, 5/1/2019-4/30/2022.
- NIH R01 DK091331, Glucose Counterregulation in Long Standing Type 1 Diabetes. (PI: Michael Rickels, Penn Medicine), 07/01/2016 - 06/30/2021. (0.6 calendar support for I. Lee, co-PI)
- ONR, Development of Control-Aware Cyber Techniques for Attack-Resilient Industrial Control & Combat Systems, Insup Lee (PI), George Pappas, Oleg Sokolsky, James Weimer $2.699M, 1/1/17-12/31/19. (Collaborative with Miroslav Pajic at Duke and Nicola Bezzo at UVA)
- ONR, Probalogical Hybrid Defense (PHD). Jonathan Smith (PI), Boo Loo, Oleg Sokolsky, Andre Scedrov, Insup Lee. $568,610, 01/01/2015-12/31/2017.
- DGIST, Korea, "High-Confidence Vehicular Control Systems," Insup Lee (PI), $300K, 12/13-11/19.
- NSF-Intel, Synergy: Collaborative Research: Security and Privacy-Aware Cyber-Physical Systems, Insup Lee (PI), Andreas Haeberlen, Bill Hanson (UPHS), Nadia Heninger, Ross Koppel, George Pappas, Linh Phan, Rita Powell, Oleg Sokolsky, Jeffrey Vagle, Christopher Yoo, $2.25M, 9/1/15-8/30/18. (Collaborative with Miroslav Pajic at Duke and Kang Shin at Michigan; $750K per year for UPenn, $375K from NSF, $375 from Intel) Additional $100K (from Intel for Lee, Sokolsky, Weimer: 9/1/18-8/30/20)
- DARPA CASE, REAFFIRM: Scenario-Based Design and Verification of Resilient Cyber-Physical Systems. R. Alur (PI), I. Lee, Rahul Mangharam, Mayur Maik, Oleg Sokolsky, James Weimer. 2/14/18-2/13/19, $1.2M.
- ONR, "Dynamic Real-Time Virtualization and Cloud Computing," Insup Lee (PI), Linh Phan, Oleg Sokolsky, $750K, 2/1/16-1/31/19.
- NSF, "CPS: Synergy: Collaborative Research: Safety-Feature Modeling and Adaptive Resource Management for Mixed-Critically Cyber-Physical Systems," Oleg Sokolsky (PI), Insup Lee, Linh Phan, $600K, 10/1/13-9/30/17. (Collaborative with Chris Gill and Chenyang Lu, WUSTL)
- DARPA HACMS, "SPARCS: Synthesis of Platform-aware Attack-Resilient Control Systems," Insup Lee (PI), Rajeev Alur, Rahul Mangharam, Nathan Michael (CMU), George Pappas, Oleg Sokolsky, Paulo Tabuada (UCLA), Stephanie Weirich. $4,813K, 8/1/12-1/31/17.
- NSF, "CPS Synergy: Collaborative Research: Trustworthy Composition of Dynamic App-Centric Architectures for Medical Application Platforms," Insup Lee (PI), Oleg Sokolksy, with KSU (Lead, John Hatcliff), $120K, 9/1/12-8/31/16.
- DGIST, Korea, "Assuring Safety and Security of Medical Cyber-Physical Systems (MCPS)," Insup Lee (PI), $200K, 11/1/12-12/31/16.
- NSF Expeditions, An Expedition in Computing for Compiling Printable Programmable Machines. Vijay Kymar (PI), Andre DeHon, Sanjeev Khanna, Insup Lee, Mark Yim. 9/1/12-8/30/17.
- NSF, "CPS:Large: Assuring the Safety, Security and Reliability of Medical Device Cyber Physical Systems," Insup Lee (PI), Alur, Hanson, Pappas, Sokolsky, et al, with University Minnesota and MGH/CIMIT. $4,950K, 10/1/10-9/30/15. (NCE to 9/30/16)
- ONR, "Theory and Virtualization Platform for Compositional Real-Time Systems," Insup Lee (PI), Linh Phan, Oleg Sokolsky, $455,822, 8/1/13-1/31/16.
- NSF, "SHB:Type I (EXP): Collaborative Research: Heterogeneous Large-Scale Telemedicine for Cardiology Patients," Oleg Sokolsky (PI), Insup Lee with Temple University (Collaborative with Shan Lin, Temple University) $300K, 9/1/12-8/31/15.

- ARO, "Compositional Framework for Complex Real-time Systems on Multicore Programs," Insup Lee (PI) and Oleg Sokolsky, $386,666, 9/1/11-8/31/14
- NSF, "CSR: Small: Resource Management for Real-Time Cloud Computing," Linh Phan (PI), Insup Lee, Boon Loo $450K, 9/1/11-8/31/14
- MKE, Korea (via Industry-Academic Cooperation Foundation, Kookmin University), "Networked Real-Time Embedded Systems Research," Insup Lee (PI), $161,500, 1/1/12-12/31/13.
- NSF/FDA Scholar-In-Residence (SIR), "Assurance Cases for a Physiologically Closed-Loop PCA Systems," Insup Lee (PI) and Oleg Sokolsky, $25K, 11/1/10-10/31/11.
- DARPA TTO, TrustForge: Flexible Access Control for VehicleForge.mil Collaborative Environment," Oleg Sokolsky (PI), Insup Lee, Zack Ives, Andreas Haeberlen, $767K, 9/1/11-8/30/12.
- NSF, "CPS:Medium:Collaborative Research: Infrastructure and Technology Innovations for Medical Device Coordination," with Kansas State University (Lead: John Hatcliff), Insup Lee (PI), Oleg Sokolsky, $660K, 9/1/09-8/31/12.
- ONR MURI, "Foundational and Systems Support for Quantitative Trust Management," $6,400K, Insup Lee (PI since 7/08), Sampath Kannan (PI, 5/07-6/08), Matt Blaze, Oleg Sokolsky, Wenke Lee (Georgia Tech), Angelos Keromytis (Columbia). 5/1/07-4/30/12.
- NSF, "CPS: Medium: Quantitative Analysis and Design of Control Networks," George Pappas (PI), Alur, Insup Lee, Ribeiro, Mangharam, $1.5M, 9/1/09-8/31/12.
- NSF, "CSR-EHCS-CPS: Robust Compositionality and Interoperability of Medical-Device Software and Systems." Insup Lee (PI), Boon Tau Loo, Rahul Mangharam, Oleg Sokolsky, Julian Goldman (MGH/CIMIT), $950K, 9/1/08-8/30/11.
- NSF, "CSR–EHS: Robust Testing by Testing Robustness of Embedded Systems," George Pappas (PI), Insup Lee, $500K, 9/01/07-8/31/10.
- NSF, "NeTS/NOSS: ASPEN: Abstraction-based Sensor Programming Environment," Zack Ives (PI), Sudipto Guha, Insup Lee, $450K, 9/1/07-8/31/10.
- NSF, "CSR–CPS: Component-based Development of Cyber-Physical Systems," Insup Lee (PI), Oleg Sokolksy, $245K, 9/1/07-8/31/10.
- AFOSR, "Resource Semantic Interfaces for Hierarchical Model-Driven Development of Embedded Systems," Insup Lee (PI) and Oleg Sokolsky, $600,000, 12/1/06-11/30/09.
- FDA TATRC, "Design Verification of Medical Device," Insup Lee (PI) and Oleg Sokolsky, $125,000, 9/25/06-9/26/07.
- NSF, "CSR-EHS: Techniques for Assuring the Safety and Reliability of Physical Computing Systems and Applications to Medical Devices," Insup Lee (PI), Victoria Rich, George Pappas, Oleg Sokolsky, Sampath Kannan, (with Julian Goldman at Mass General Hospital) $780,000, 9/1/05-8/30/09.
- Honeywell, "Modeling and Analysis using AADL," Oleg Sokolsky (PI), Insup Lee, $100K, 2007
- NSF/FDA Scholar-In-Residence at FDA, "Applying Formal Methods to Improve the Quality of Software in Medical Devices," Insup Lee, $30,000, 8/1/06-7/31/07.
- NSF, "Collaborative Research: CSR-EHS: A Hierarchy of Models for Embedded Software," Insup Lee (PI), Rajeev Alur (with Wayne Wolfe at Princeton University), $300,000, 9/1/05-8/30/08.

- ARO, "Extracting Formal Models from Informal Requirements and Using Them for Validation," Insup Lee (PI) and Aravind Joshi, $325,000, 4/15/05-4/14/08.
- ARO, "Enhancing Dependability of HCES," Insup Lee (PI), Sampath Kannan, Oleg Sokolsky, $225,000, 4/15/05-4/14/07.
- NSF, "Extracting Traceable Formal Models from Natural Language Policy Documents," Insup Lee (PI), Aravind Joshi, 9/04-8/06, $200,000.
- ONR MURI, "Anomaly and Misuse Detection in Network Traffic Streams — Checking and Machine Learning Approaches," Sampath Kannan (PI), Insup Lee, Oleg Sokolsky, Linda Zhao, 6/04-5/07, $1,000,000. (with Wenke Lee at Georgia Tech, Diana Spears at Wyoming, William Spears at Wyoming)
- NSF, "Synthesis of Embedded Software from Hybrid Models," Rajeev Alur (PI), Insup Lee, George Pappas. 9/04-8/07, $400,000.
- Lockheed Martin, "Run-time Environment and Design Application for Polymorphous Technology: Phase II," Insup Lee, Oleg Sokolksy (PI), 4/1/03-12/31/05, $500,154.
- "HCMDSS 2005," George Pappas and Insup Lee, $50,000, 6/1/05-12/1/05.
- NSF, "Testing Based on Hybrid Systems Models," 9/1/02-8/30/05, $450,000, Insup Lee (PI), Oleg Sokolsky, Duncan Clarke (South Carolina), Steve Vestal (Honeywell).
- ARO URI, "Advanced Tool Integration for Embedded Systems Assurance," 6/1/01-5/30/06, $4,984,330 Insup Lee (PI), Rajeev Alur, Carl Gunter, Sampath Kannan, Oleg Sokolsky. (with K. Shin at Michigan, E. Gunter at UIUC, R.P. Cook at Georgia Southern University)
- NSF, "An Integrated Approach to Improving Design-Time and Run-Time Confidence," 6/1/00-5/30/03, $300,000. Insup Lee (PI), Oleg Sokolsky.
- DARPA MOBIES, "Design, Implementation, and Validation of Embedded Software," 6/1/00-9/30/03, $2,184,320. Rajeev Alur, Vijay Kumar, Insup Lee (PI), George Pappas.
- Boeing, "Enabling Technologies for Distributed Mission Computing," Insup Lee (PI), George J. Pappas, Oleg Sokolsky, 9/02-8/03, $50,000.
- Lockeed Martin, "Run-time Environment and Design Application for Polymorphous Technology," 7/1/01-6/30/03, $200,000. Insup Lee, Oleg Sokolsky (PI).
- NSF, "RONEE: An Integrated Eng. Method and Tool Environment for Reliable Object-Oriented Real-Time Distributed Systems," 9/1/00-8/30/03, $112,000. Insup Lee. Subcontract from UC-Irvine.
- NSF-CISE equipment grant, "Asymmetric Bandwidth Channel," PI: R. Bajcy, Co-PI: V. Kumar, I. Lee, J. Smith, 6/1/97-5/30/02, $750,000.
- ONR, "Semantic Consistency in Information Exchange," 4/30/97-4/29/02, $1,197,389, with Sampath Kannan. (ONR MURI with Stanford University and Cornell University)
- ARO, "Integrating Formal Methods for Software Engineering: High Assurance Systems, Tools and Environments, 9/1/98-8/31/01, $316,340, with Carl Guner, Sampath Kannan.
- ARO, "Checker, self-tester and self-corrector," 7/6/98-7/5/01, $270,000, with Sampath Kannan.
- DARPA ITO MARS Program, "Control of Multiple Autonomous Robots," 7/1/99-12/31/00, $746,309 (PI: Vijay Kumar)

- NSF, "A Unified Framework For Improving the Reliability of Reactive Systems," 05/01/97 - 04/30/00, $186,000 with Sampath Kannan.
- AFOSR, "Advanced Formal Methods for Reliable Critical Systems Software," Aug 15, 1995 - Aug 14, 1998, $1,220,000, Insup Lee (PI), Rance Cleaveland (N.C. State University), Scott Smolka (SUNY-Stony Brook).
- AFOSR AASERT, "Developing End-to-End Design and Testing Methodologies Based on Formal Methods," July 1996 - July 1999, $148,389.
- NSF, "Hierarchical Specification, Analysis, and Testing of Real-Time Systems," July 1, 1995 - June 30, 1998, $189,056.
- ARO, "Formal Methods for Software Engineering," Feb 15, 1995 - Feb 14, 1998, $900,000. (PI: Dale Miller, Co-PI's: Carl Gunter, Insup Lee)
- NSF, "Telementoring: A Novel Approach to Teaching Undergraduate Computer Scientist," Sep 1992 to Feb 1997, $400,000. (PI: Jonathan Smith, Co-PI's: Susan Davidson, Dave Farber, Insup Lee, Ira Winston)
- NSF, "Using Parallelism and Randomness in the Analysis of Large-Scale Real-Time Systems," Sept 1993 – Aug 1996, $200,000. (PI: Insup Lee, Co-PI: S. Rajasekaran) Additional $5,000 awarded for REU (Research Experience for Undergraduates).
- Sun Academic Equipment Grant, "Telementoring: A Novel Approach to Teaching Undergraduate Computer Scientists," June 1, 1993 - May 31, 1996, $85,000. (PI: Jonathan Smith, Co-PI's: Susan Davidson, David Farber, Insup Lee, Ira Winston)
- NSF, "Teleconferenced Workstations: Improving Experimentation in Undergraduate Education," July 1, 1994 - June 30, 1996, $76.000. (PI: I. Lee, Co-PI's: S. Davidson, J. Smith)
- ONR AASERT award, "Parallel Simulation of Real-Time System Design Specifications for Probabilistic Model Checking," Sept 1992 to Aug 1996, $120,000.
- NSF, "Concur 1995: Sixth International Conference on Concurrency Theory; University of Pennsylvania, Philadelphia, PA; Aug 21-24, 1995," Sep 1, 1995 - Feb 29, 1996, $5,000.
- ONR, Fund for AFOSR/ARO/ONR tutorial/review on "Formal Methods", May 1992, $3,000.
- University of Pennsylvania, "A Laboratory for Visualizing Computing Paradigms," The University of Pennsylvania's Undergraduate Initiatives Funds, 1991, $41,282. (Project Director: Susan B. Davidson, Co-Directors: Peter Buneman and Insup Lee)
- NSF, "A Formal Approach to Real-Time Specification and Analysis," June 1991 to Nov 1994, $407,961. (PI: Insup Lee, Co-PI: Susan Davidson)
- ONR, "Formally Integrating Real-Time Specification and Implementation," October 1991 to September 1993, $258,928. (PI: Insup Lee, Co-PI: Susan Davidson)
- ONR, "Formally Integrating Real-Time Specification and Implementation," October 1988 to September 1991, $408,000. (PI: Insup Lee, Co-PI: Susan Davidson)
- NSF, "A Distributed Testbed for Real-Time Active Sensing," Equipment Grant, May 1988 to October 1989, $29,305. (PI: Insup Lee, Co-PI's: Kwangyoen Wohn and Susan Davidson)
- AT&T, "Study of Protocol Verification Issues for DMI," September 1986 to August 1989, $175,000. (PI: Insup Lee, Co-PI: Susan Davidson)

- NSF, "A Proposal to Integrate Sensing with Actuation to Form a Robust, Intelligent, Robot Control System," March 1986 to February 1988, $304,992. (PI: Richard Paul, Co-PI's: Ruzena Bajcsy, Insup Lee, Max Mintz)
- ARO, "Distributed Expert Systems," September 1986 to June 1987, $75,000. (PI: Tim Finin, Co-PI's: Peter Buneman, Susan Davidson, Insup Lee, Lokendra Shastri)
- NSF, "A Distributed Testbed for Active Sensory Processing," July 1985 to December 1987, $66,208. (PI: Insup Lee, Co-PI: Ruzena Bajcsy)

Technology Transfer - Consultant to Small Business Grants

- STTR Phase I and II, Progressive Model Generation for Adaptive Resilient System Software, Gramma Tech, Inc., Ithaca, NY, Oleg Sokolsky (PI), Insup Lee, 2013-2015.
- STTR Phase I and II, "Simulation and Analysis Toolset for an Industry Standard Embedded System Specification Language," Fremont Associates, LLC, Camden, South Carolina. Sep 2004-Jun 2005, Sep 2005-Sep 2007.
- SBIR Phase I and II, "Software Tools for Formal Specification and Verification of Distributed Real-Time Systems," CCCC (Computer Command and Control Company), Philadelphia, 1993-1996.

Patents

- Insup Lee, Hyonyoung Choi, Amanda Lor, Michael Megonegal, Xiayna Ji, Amanda Watson, Jean Park, Oleg Sokolsky. United States Patent Application Serial No. 18/542,492 for METHODS, SYSTEMS, AND COMPUTER READABLE MEDIA FOR MANAGING MEDICAL DEVICES, Oct 10, 2024. (Pending)
- Sanjian Chen, James E. Weimer, Insup Lee. U.S. Patent No. 10,792,423 for METHODS, SYSTEMS, AND COMPUTER READABLE MEDIA FOR PHYSIOLOGY PARAMETER-INVARIANT MEAL DETECTION, Oct 6, 2020.
- Andrew King and Insup Lee. United States Patent No. 9,270,527 for Methods, Systems, and Computer Readable Media for Enabling Real-Time Guarantees in Publish-Subscribe Middleware Using Dynamically Reconfigurable Networks, Feb 23, 2016.