

2021 BOARD NOMINEE

Stephanie Forrest

Professor and Center Director, Biodesign Institute and School for Computing, Informatics and Decision Sciences Engineering
Arizona State University



Awards and Honors and Year Received

- IEEE Security and Privacy, Test of Time Award, 2020
- ACM/IEEE International Conference on Software Engineering, Most Influential Paper Award, 2019
- IEEE Fellow, 2015
- ACM/AAAI Allen Newell Award, 2011
- NSF Presidential Young Investigator Award, 1991

Involvement in CRA Activities

- Current: Member of CRA Board
- Chair of CRA Government Affairs Committee, 2016-present
- Organized CRA Snowbird Workshop for new Dept. Chairs, 2015
- Member, Computing Community Consortium (CCC) Council, 2009,Äì2012
- Member, NSF CISE Advisory Committee, 2006,Äì2008

Other Relevant Experience

Jefferson Science Fellow, Senior Science Advisor to the U.S. Dept. of State, 2012-2014
Univ. New Mexico CS Dept. Chair, 2007-2011
Santa Fe Institute: Science Board Co-Chair, 2010,Äì2013; Science Board Member, 1991,Äì1997,1998,Äì2001,2003,Äì2008,2009-2015; External Faculty, 1990,Äìpresent; Resident Faculty, 2003-2006

Research Interests

Biological modeling: immunology and evolutionary diseases (such as influenza and cancer)
Cybersecurity: intrusion detection, engineered diversity, policy
Automated software repair
Evolutionary computation

Personal Statement

Forrest has over 25 years experience conducting interdisciplinary research in computer science, biology, and complex systems. After many years focusing on technical solutions to

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technical problems, her current research recognizes that cyber-issues also involve systemic social, economic, and political components, which must be incorporated into successful solutions. She brings deep research expertise across computer science, experience at the State Dept., experience and commitment to expanding opportunities for disadvantaged students, and a special interest in interdisciplinary science. She has trained 24 Ph.D. students, has an h-index of 82, served as a Dept. Chair and on numerous scientific boards.

STEPHANIE FORREST

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February 1, 2021

Professional Preparation

B.A. St. John's College, Annapolis, MD and Santa Fe, NM, 1977.

M.S. Computer and Communication Sciences, Univ. of Michigan, Ann Arbor, MI, 1982.

Ph.D. Computer and Communication Sciences, Univ. of Michigan, Ann Arbor, MI, 1985.

Appointments

2017–present. Arizona State Univ., Tempe, AZ. Founding Director, Biodesign Center for Biocomputation, Security and Society, and Professor of Computing, Informatics, and Decision Sciences Engineering (CIDSE).

2013–2014. U.S. Dept. of State. Senior Science Advisor, Communication and Information Policy (Jefferson Science Fellowship).

1990–2017. Univ. of New Mexico, Albuquerque, NM. Distinguished Prof. Emerita, 2017–present; Distinguished Prof., 2013–2017; Regents Prof., 2012–2017; Dept. Chair, 2006–2011; Prof., 1999–2013; Assoc. Prof., 1994–1999; Assist. Prof., 1990–1994; Secondary appt. in Dept. of Biology, 2001–2017.

2003–present. Santa Fe Institute. Santa Fe, NM. External Professor, 2006–present; Research Professor, 2003–2006; Interim Vice President for Academic Affairs, 1999–2000.

1996–1997. Artificial Intelligence Laboratory, Massachusetts Institute of Technology, Cambridge, MA. Visiting Associate Professor (sabbatical leave).

1988–1990. Center for Nonlinear Studies and Computing Division, Los Alamos National Laboratory, Los Alamos, N.M. Director's Postdoctoral Research Fellow.

1985–1988. Teknowledge, Inc., Palo Alto, CA.: Research and Advanced Development.

Selected Professional Activities

Computing Research Association: Board of Directors, 2015–present; Chair, Government Affairs Committee, 2016–present; Computing Community Consortium (CCC) Council, 2009–2012; speaker and mentor at the 2018 CRA-W Career Mentoring Workshop for female CS faculty.

Santa Fe Institute: Science Board Co-Chair, 2010–2013; Science Board Member, 1991–2015.

National Science Foundation: Computer and Information Science and Engineering (CISE) Advisory Committee, 2006–2008.

Promotion of female faculty: As UNM Dept. Chair, recruited and hired female and minority faculty (transforming the dept. from 0% minority and 5% female to 22% minority and 22% female).

Selected Honors and Awards

IEEE Security and Privacy Symposium 2020 Test of Time Award for *A sense of self for Unix system calls* published in 1996

ACM/SIGSOFT and IEEE/TCSE 2019 Most Influential Paper Award for a paper published at the 2009 Int. Conf. on Software Engineering (ICSE)

ACM/SIGEVO 2019 Impact Award for highest impact paper published at the 2009 Conf. on Genetic and Evolutionary Computation (GECCO)

Elected IEEE Fellow, 2015.

Santa Fe Institute Stanislaw Ulam Memorial Lectureship, 2013.

ACM/AAAI Allen Newell Award, 2011.

IFIP TC2 Manfred Paul Award for Excellence in Software: Theory and Practice, 2009.

Five Selected Publications (out of 184 total, H-index = 82)

R. Miikkulainen and S. Forrest. A biological perspective on evolutionary computation. *Nature Machine Intelligence* 3:1–7, 2021.

J. Liou, X. Wang, S., and C. Wu. Post-compiler performance tuning for general-purpose gpu kernels. *ACM Trans. on Architecture and Code Optimization* 17:4 (2020)

B. Edwards, A. Furnas, S. Forrest, and R. Axelrod “Strategic aspects of cyber attack, attribution, and blame” *Proc. Nat. Acad. Sci (PNAS)* 114(11):2825–2830, 2017.

B. Edwards, S. Hofmeyr, and S. Forrest. Hype and heavy tails: A closer look at data breaches. In Workshop on the Economics of Information Security, June 2015. Best paper award.

W. Weimer, T. Nguyen, C. Le Goues, and S. Forrest “Automatically finding patches using genetic programming.” In *Proc. of Intl. Conf. on Software Engineering (ICSE)*, 2009. 2019 Most Influential Paper Award (for papers published at ICSE in 2009). SIGSOFT Distinguished Paper Award. IFIP TC2 Manfred Paul Award for Excellence in Software.

Funded Research

Served as Principle Investigator or Co-Principle Investigator on over 50 federally funded research grants totally over \$50 million.