DEBORAH SILVER, PH.D.

Executive Director,
Professional Science Master's Program – Master of Business and Science Degree
Rutgers, The State University of New Jersey – New Brunswick, Newark, Camden

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EDUCATION:

Ph.D. *Princeton University*, *Dept. of Computer Science, School of Engineering and Applied Science,* Princeton, NJ. Supported by the Hewlett-Packard Faculty Development Fellowship. *PhD Dissertation: Geometry, Graphics, & Numerical Analysis*. Thesis Advisor: Prof. David Dobkin.

B.S. *Columbia University, School of Engineering and Applied Science, New York, NY. Major: Computer Science*.

PROFESSIONAL EXPERIENCE:

Rutgers, The State University of New Jersey:
March 2009 - present: Executive Director, Professional Science Master's Program – Rutgers University - New Brunswick, Rutgers University - Newark, and Rutgers University - Camden
September 2005 -present: Professor, Dept. of Electrical and Computer Engineering (ECE),
    1995-2005: Associate Professor, Dept. of ECE, *1988-2005:* Assistant Professor, Dept. of ECE
September 2008-2010: Associate Dean of Continuing and Professional Education, Rutgers School of Engineering
September 2007-2010: Associate Director, Center for Advanced Information Processing (CAIP) Research Center
Summer 1991, 1992: NASA-ASEE -Stanford Summer Faculty Fellowship, Ames Research Center, Moffett Field, CA

ACADEMIC INNOVATION AND ADMINISTRATION HIGHLIGHTS:

- Designed and implemented a new *university-wide* (New Brunswick, Camden, Newark) multidisciplinary master's degree: Rutgers Professional Science Master's (PSM) program which offers the Master of Business and Science degree—currently the largest PSM in the United States. This degree is awarded by the graduate schools and the program reports at the university level;
- Created a new academic structural model to accommodate science-based graduate interdisciplinary education and enable new program development based upon workforce demands;
- Started and grew the degree to ~700 students (over 2000 alumni). This is one of the largest and most diverse master's program at Rutgers and is financially self-sufficient. This program also had the largest growth during 2020-2021;
- Secured $1.5 million in government funding (grants) to establish the program, and has received continued funding to study issues relating to STEM master's degrees;
- Co-authored and submitted PSM program proposal through the state approval process;
- Collaborated with 10 different schools (and hundreds of faculty) on three campuses—Rutgers University–New Brunswick, Rutgers University– Newark, and Rutgers University–Camden— to

create more than 25 interdisciplinary and professional science curricula spread over three specific STEM disciplines: life sciences, engineering and computing;
- Developed fully online degree offerings and continuing education offerings;
- Developed PhD and Postdoctoral certificates to address workforce needs;
- Used data driven methodology (real-time labor workforce & IPEDS data) to strategize and create new academic programs;
- Worked closely with the Office of International Programs to develop global memoranda of understanding and programs;
- Developed a new financial model and worked with university budgeting for implementation;
- ***Public-Private Partnership****:* Worked with local organization and corporate partners to help develop a sustainable externship program accessible to both *undergraduate and graduate* students (multinational corporations including L'Oréal, Citi Ventures, Conrail, Ricoh USA, Johnson & Johnson, Sesame Workshop, and Church & Dwight) – *this is now the largest academic corporate partnership program at Rutgers* (~550 students/yr);
- *Associate Dean:* Created new lifelong learning initiatives for the School of Engineering, including: continuing education courses and development of a Rutgers' makerspace;
- *Research Center:* Associate Director of the CAIP Center, one of the first interdisciplinary (public-private) computing research centers at Rutgers. Responsibilities included: developing new research initiatives, fostering research, arranging continuing education opportunities, and outreach to corporations.

CURRENT PROFESSIONAL ACTIVITIES & RECENT AWARDS:

- *Board of Governors:* Institute of Electrical and Electronics Engineers Computer Society (IEEE) - elected in 2021. *The IEEE is the world's largest technical professional organization.* IEEE Computer Society Golden Core Member recipient, 2022 (award for distinguished core of dedicated volunteers and staff).
- *Board Member*: National Professional Science Master's Association (NPSMA) -- 2017-present; *Vice President:* Board of Directors, NPSMA (2013-2017), PSM Affiliation Committee Board Member (2013-2019).
- *Board Member:* IEEE Visualization Steering Committee (VSC) -- 2020-present. *The VSC provides long-term scientific and organizational oversight of IEEE VIS community.*
- *Judge* - New York Academy of Sciences Blavatnik Awards for Young Scientists (2013-2020).
- *International Fellowship Panelist, American Association of University Women (2019*-present).
- *Awardee*- IEEE Visualization Academy -- October 2020. *Induction into the IEEE Vis Academy is the highest and most prestigious honor in the field of computer visualization.*
- *Conference Committees:* IEEE VIS & EuroVis Papers and Workshop Committees, NPSMA

SELECTED RECENT FUNDING:

Grants from National Science Foundation, Department of Labor, Department of Education, Department of Energy, NASA, Airforce Research Labs (~25M combined grant totals).
- National Science Foundation, Workshop Proposal: STEM Master's Individual Development Plans as an Essential Tool in Workforce Development, D. Silver (PI), Collaborative proposal with NPSMA and Council of Graduate Schools, 2020-2021.
- National Science Foundation, TIPODS_X:RES: Collaborative Research: Improving Templated Microstructures via Topological Analysis. D. Birnie (PI), D. Silver (co-PI), 2018-2021.
- National Science Foundation, Science Master's Program: Fueling Innovation in NJ through Graduate Education, , D. Silver (PI), D. Finegold, H. Herrara, A. Gates, B. Zilinskas, 2010-2013.
- Department of Education, FIPSE, Developing Leaders for NJ Science Based Industries, D. Finegold (PI), D. Silver (PI 2010-2013).

- Department of Labor, WIRED Bio-1, D. Finegold (PI), D. Silver (PI of the PSM Portion), 2007-2011.
- Department of Energy, Activity Recognition for Ultra-Scale Visualization, part of the SciDAC Institute for Ultra-Scale Visualization, D. Silver (PI), 2010-2013.
- New Jersey Technology Council, Technology & Entrepreneurship Talent Network, 2012-2013.
- National Science Foundation, CI-TEAM Demonstration Project: Developing Scientific Visualization Literacy for Cyberinfrastructure Training, D. Silver (PI), M. Tremaine, and K. Bemis, 2008-2010.
- National Science Foundation, Illustrative Deformation., D. Silver (PI), 2007-2010.

SELECTED PUBLICATIONS:

Over 125 Journal and Conference publications in the area of scientific visualization, information visualization, computer graphics, and graduate education.

- C. West, L. Strausbaugh, D. Silver, E. Friedman and H. Okahana, Findings from the NPSMA-CGS STEM Master's IDP Survey, NPSMA Spring Innovator, 2022.
- L. Liu, D. Silver, and K. Bemis, Visualizing Acoustic Imaging of Hydrothermal Plumes on the Seafloor, IEEE Computer Graphics and Applications, vol. 41, no. 2, 2021.
- L. Ryan, D. Silver, D. Ebert and R. Laramee, Teaching Data Visualization as a Skill, Visualization Viewpoints, IEEE Computer Graphics and Applications, 2019.
- Li. Liu, D. Silver, and K. Bemis. Application Driven Design: Help Students Understand Employment and See the "Big Picture". IEEE Computer Graphics and Applications Vol. 38, No.3, 2018
- L. Liu, D. Silver, K. Bemis, D. Kang, and E. Curchitser. Illustrative Visualization of Mesoscale Ocean Eddies. Computer Graphics Forum, Vol. 36, No. 3, 2017.
- K. Bemis, D. Silver., G. Xu, R. Light, D. Jackson, D. Jones, S. Ozer, L. Lui, The path to COVIS: a review of acoustic imaging of hydrothermal plumes. Deep Sea Research II, 2015.
- S. Ozer, D. Silver, K. Bemis, and P. Martin, Activity Detection in Scientific Visualization, IEEE Transaction on Visualization and Computer Graphics, Vol. 20, No. 3, 2014.
- S. Varma and D. Silver, Fueling Innovation in Graduate Education, Creating Tomorrow's Mathematics Professionals, (Book Chapter), Proceedings of the PSM Workshop, COMAP 2013.
- K. Oh, K. Bemis, X. Ma, M. Tremaine, and D. Silver, Uncovering Visualization Properties that Confuse, Proceedings of the American Society for Info Science & Technology, 49(1), 1-4, 2012.
- C. Correa, D. Silver and M. Chen. Illustrative Deformation for Data Exploration, IEEE Transactions on Visualization and Computer Graphics, Vol.13, No.6, 2007.
- N. Cornea, D. Silver and P. Min, Curve Skeleton, Properties and Algorithms, IEEE Transactions on Visualization and Computer Graphics, Vol. 13, No. 6, 2007.
- D. Silver and X. Wang, Tracking and Visualizing Turbulent 3D Features. IEEE Transactions on Visualization and Computer Graphics, Vol. 3, No. 2, 1997.

PATENT:

Resample and Composite Engine for Real-Time Volume Rendering, Inventors: H. Ray and D. Silver, Patent No. US RE42,638 E December 2003, Re-issued 2011.

TEACHING AND COURSE DEVELOPMENT:

ECE: Programming Methodologies for Numerical Computing and Computational Finance, Software Engineering, Visualization and Advanced Computer Graphics, Intro to Computer Graphics, Robotics and Vision, Data Structures, Professionalism and Ethics, ECE Capstone. *MBS:* Mobile Applications, User Experience Design, MBS Capstone, Analytics Practicum, Externship, and helped develop over 30 courses for the MBS program in Life Sciences, Engineering, and Computer and Information Sciences.