

CURRICULUM VITAE

Kevin Gardner Kirby

Evan and Lindsay Stein Professor of Biocomputing
 School of Computing and Analytics, College of Informatics
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On a research sabbatical 7/1/2026 - 8/1/2027

■ ADMINISTRATIVE LEADERSHIP EXPERIENCE

Northern Kentucky University

Dean, College of Informatics (7/1/2011 – 6/30/2026).

Chair, Department of Computer Science (7/1/2008 - 6/30/2011).

■ ACADEMIC APPOINTMENTS

Northern Kentucky University

Evan and Lindsay Stein Professor of Biocomputing (2004 – *present*)

Professor (2003 – present), Computer Science

Associate Professor (1997-2003), Computer Science

Assistant Professor (1994-1997), Computer Science

Sogang University, Seoul, South Korea

Visiting Research Professor (2000-2001), Computer Science [*sabbatical year*]

Wright State University, Dayton, Ohio

Assistant Professor (1988-1994), Computer Science and Engineering

■ EDUCATION

Ph.D. 1988 Computer Science (*Cognate: Physics*)

Wayne State University, Detroit.

Dissertation: *Intraneuronal Dynamics and Evolutionary Learning*. Advisor: Michael Conrad.

M.S. 1986 Computer Science

B.A. 1984 Mathematics (*Minor: Linguistics*)

Wayne State University, Detroit.

■ AWARDS AND HONORS

Mathematical Association of America **George Polya Award**, 1998.

Northern Kentucky University College of Arts and Sciences **Outstanding Junior Faculty Award**, 1997.

LEADERSHIP, ADMINISTRATION, SERVICE

■ SELECTED ACCOMPLISHMENTS AS DEAN OF INFORMATICS (NKU)

For fifteen years, from 2011 to 2026, I led a college with a \$9M budget, 63 full time faculty, 11 full time staff, 13 undergraduate degree programs, 4 graduate degree programs, 2 schools, and 1 center, with an enrollment of 1,500 students (2026 data).

Envisioned, planned, and led a reorganization of the college, 2021-2022, transforming an eighteen year-old legacy three-department structure into a more efficient and agile two-school structure, internally recruiting the next generation of school leaders.

Launched (and often led) notable Artificial Intelligence academic and outreach initiatives. I was the organizer and lead lecturer for the *Born Before AI* lecture series (2024-), and coordinated and ran sessions at the *Navigo AI Scholars* program for high school students (2024-2026), having raised external funds for each. I framed and initiated the interdisciplinary *Applied AI* Minor (2023-), and worked to initiate the general education *AI Literacy* course (2025-). My AI-related efforts as dean culminated in the groundwork for NKU's *AI Agency*, with a series of external project courses, starting in Fall 2026, developed in close collaboration with businesses and economic development organizations.

Increased annual gift totals to the College of Informatics by over 3X, raising over \$12M during my fifteen years as dean. The college was one of NKU's top colleges in funds raised each year FY12-FY26. This culminated in a \$650,000 gift in June 2026 for a complete upgrade to the video wall in the George and Ellen Rieveschl Digitorium, the heart of the college's regional landmark building, Griffin Hall.

Obtained \$400,000 in donor funds to establish the JRG Cyber Threat Intelligence Lab, a 2017 remodeling and equipping of a prominent Griffin Hall ground floor space to serve as a visually compelling location for hands-on cybersecurity and outreach programs.

Worked to establish an international partnership on graduate education in Cybersecurity with St. Andrews Georgian University in Tbilisi Georgia. Traveled to the US State Department in 2024 to meet with officials on this relationship. As of June 2026 it has graduated 95 students from a program comprised of online coursework in NKU's MS in Cybersecurity, local workshops and corporate visits in Cincinnati/NKY, and workshops led by NKU faculty in-person in Tbilisi. I have made five visits to Tbilisi (including two visits to the US Embassy there and live media appearances on three national television networks) as part of building this program.

Continually engaged in media presence, gave external talks, created new web and print materials, collaborated with other organizations, and engaged a branding firm (Intrinsic) to increase regional awareness of the College of Informatics. I've appeared live on all five Cincinnati-area local television stations and the local NPR station, and done numerous taped interviews.

Worked with Duke Energy to obtain funding and launch the Duke Energy Innovation Lab in Griffin Hall in 2025, serving as an Internet of Things workshop for classroom and outreach projects.

Enhanced programs in the college to bring in students from urban Cincinnati Public Schools that were not significantly represented at NKU, through donor funds (the Crawford Scholarship).

Led the college through the creation of 6 degree programs (BA Health Communication, BS Data Science, BS Health Informatics, BS Cybersecurity, BS Applied Software Engineering, MS Cybersecurity). Data Science, launched in 2013, was only the third such program in the US and earned ABET accreditation in August 2022.

Led the college through the sunseting of three graduate programs (MS Computer Information Technology, MS Computer Science, MA in Communication) to adapt to changing needs.

Reoptimized college staffing in response to large personnel cuts and the budget-driven termination of the college's award-winning outreach arm (Informatics+ / Center for Applied Informatics) in 2022. I repurposed vacant faculty lines and converted staff lines, to reconstruct outreach, event, and communications operations on a leaner basis, to address the continual need for Informatics talent.

Through the College of Informatics, NKU was designated as an NSA Center of Academic Excellence in Cyber Defense Education in 2014, renewed in 2019 and 2024.

Wrote and presented materials and led a webinar on the Griffin Hall Informatics building, presented as part of the Learning Systems Collaboratory report to the National Science Foundation on Innovative Learning Spaces, 2014.

Enhanced and diversified the membership of the College of Informatics Advisory Board, to become one of the most active boards at the university, consisting of C-level leaders from the private and public sectors.

Initiated reorganization of the college's department staffing model to shift from a “flat” academic coordinator model to a more efficient and progressive cross-department staff team. Restructured leadership into an Leadership Team and an Extended Leadership Team, and defined new positions such as a Director of Budget and Operations.

Established an Informaticist-in-Residence program bringing in scholars from Cologne and Yangon.

Wrote a nomination proposal leading to the College being awarded an AASCU *Excellence and Innovation in Regional and Economic Development* Award in 2014, recognizing the work of the college's outreach arm, the Center for Applied Informatics, having students do mobile app development for business and community clients.

Continued to teach periodically as dean, as an unpaid overload: an Honors Seminar (*The Extremes of Language*, 2020), an advanced AI course (*Deep Learning*, 2018), and an NSF-grant funded course (*Principles of Informatics*) co-taught with faculty members in History and Geography (2014), Journalism (2022), and English (2022-24).

■ UNIVERSITY SERVICE (NKU)

Excluded from this list is any service work that is a standard part of my administrative roles (dean or chair).

Co-Chair, College of Arts and Sciences Dean Search Committee (2025).

Co-Chair, Norse Network Hub Task Force (2024).

NKU International Partner Visits – St Andrews University and Ministry of Education, Tbilisi, Georgia (2022, 2023, 2024, 2025, 2026).

Co-Chair, Academic Affairs Program Review Criteria Refinement Ad Hoc Working Group (2021)

Success By Design (Strategic Planning) **Core Team**, Strategic Advisory Group (2019-*present*).

Co-Chair, College of Business Dean Search Committee (2019).

NKU East Asia Partnership Trip (with Provost and faculty)- China, Vietnam, Myanmar (2017).

NKU Partnership Trip- University of Computer Studies, Yangon, Myanmar (2016).

NKU Partnership Trip- Chengdu (3 universities), Ho Chi Minh City (1 university) (2016).

Vice President for Health Innovation Search Committee (2017).

Co-Chair, College of Health Professions Dean Search Committee (2017).

Co-Chair, College of Arts and Sciences Dean Search Committee (2016-17).

Budget Model Steering Committee (2015).

Honors College Task Force (2015).

Health Innovation Center Steering Committee (2014-).

Co-Chair, College of Health Professions Dean Search Committee (2014-15).

Sri Lanka Partnership Exploration Committee, Sri Lanka Trip (with Provost + Administrators) (2014).

Health Innovations Center Architect Selection Committee (2014).

Academic Innovation Implementation Team (2014).

Technology Strategies Implementation Team (2014).

Chair, College of Arts and Sciences Dean Search Committee (2013-14).

Vice Chair, Provost Search Committee (2013).

Chase Law School Dean Search Committee (2012-13).

Co-chair, Classroom Utilization and Scheduling Policy Committee (2010–11).

Center for International Education Advisory Board (2009–2011).

Honors Faculty Advisory Board (2009–2011).

International Recruiting Agency Exploration Team – represented NKU on visits to agencies in Korea, China, India and Vietnam as part of a six-university team organized through the University of Cincinnati (May 2008).

Research, Grants and Contracts Director Search Committee (2008).

Dean of International Education Search Committee (2008).

Honors Program Director Search Committee (2008).

Department of Physics and Geology, External Promotion Committee member (2008).

Infrastructure Management Institute Advisory Board (2008–2011).

Visions, Values, and Voices Panel (2006-2007).

Chair, College of Informatics Inaugural Dean Search Committee (2006).

Frank Sinton Milburn Outstanding Professor Selection Committee (2006, 2007).

Regents Professor Selection Committee (2007, 2011).

Faculty Senate Professional Concerns Committee (2005-2007).

Graduate Council (1999-2000; 2001–2005)

- **Chair** (2004-05)
- **Vice-Chair** and Secretary (2003-04).

College of Informatics Implementation Task Force (2004-05).

Alternative Spring Break / Service Learning Committee (2004).

Provost Search Committee (2003)

Graduate Directors Committee (2000–2004)

- Representing the Master of Science in Computer Science program.

Faculty Co-Founder and Co-Leader, Alternative Spring Break/Mexico (2008, 2006, 2003, 2000, 1999)

- A program in which two NKU faculty members and 9-14 NKU students spend a week living with host families and doing volunteer service work in impoverished Mexican communities. Co-initiated the program with Steve Wilkinson, 1999.

International Initiatives Committees (1999–present)

- **Report author** of *Internationalizing NKU: An Action Plan*, 2004
- **Report author** of *Globalizing NKU*, 1999.

Department of Physics and Geology, Reappointment, Promotion and Tenure Committee (2001-04).

Learning Systems Advisory Committee (2001–present)

- **Chair**, Joint Ad-Hoc Faculty Senate Professional Concerns / Information Technology Committee on Proposed Online Course Evaluation System. Writing a specification of the system in order to obtain an external cost estimate (2002).

Search Committee, Director for NKU Institute for New Economy Technologies (2002-03)

Chair, Search Committee, Executive Director for Educational Outreach (May-July 2002).
Information Technology Advisory Task Force (2001-2002)

Bioinformatics Group / CINSAM (Fall 2001)

- **Co-author**, NKU proposal to “Kentucky Bioinformatics Research Infrastructure Network”, a National Institute of Health program. Funded at \$195,000 over 3 years.

Center for Information Technology Committee (2001-2002)

- An ad hoc committee to explore use of the Kentucky New Economy funds to set up a possible Information Technology Center on campus.

General Studies Task Force, Subcommittee on Scientific and Quantitative Literacy, Fall 2000.

- Helped draft a statement for inclusion in the General Studies Program proposal.

NKU Program of Distinction Proposal Committees / **CINSAM** (1998–1999)

- **Primary author** of the *Center for Computational Analysis and Design (CCAD)* proposal document, one of two precursors to the CINSAM proposal.
- **Primary author** of the *Center for Integrative Natural Science (CINSAM)* proposal document. The center now spans three colleges and is still thriving as of 2021.

Department of Art, Reappointment, Promotion and Tenure Committee (1998, 1999)

NKU Web Pioneers Group (1998)

- Contributed ASP web-programming code infrastructure to a project headed by David Adams and Rudy Garns to develop an environment for web-supported courses at NKU. In use until 2001 (later superseded by the Blackboard then Canvas LMSs).

Faculty participant, NKU Latin America Awareness Group 1997-1999.

- Helped organize special events on social and political issues, and managed the website.

■ DEPARTMENT SERVICE (COMPUTER SCIENCE, prior to Dean role)

Chair, Department of Computer Science (interim 2008–09; chair 2009-2011).

Chair, Reappointment Promotion and Tenure Committee (2003–2006, 2007-2008)

Chair, Computer Science Search Committees (2004, 2005)

Director, BS and MS Programs in Computer Science (1999–2000, 2001–2005)

Department Communications and Publicity Committee (1999–2000, 2001–2005)

Departmental Computer Laboratory Founder/Administrator (1996–1999)

Proposal Committee, Master of Science in Computer Science (1997)

Department Policies Committee, Fall 1999 - Spring 2000

New Faculty Mentor Committees

Departmental Search Committees

■ SUMMARY OF PRE-NKU SERVICE WORK (Wright State University)

Department

- Chair, Graduate Admissions Committee., 1990-1994.
- Chair, Teaching Committee, 1991-1992.
- Curriculum Committee, 1993-1994.
- PhD Qualifying Examination Committee, 1991 and 1993.

College (College of Engineering)

- College Undergraduate Petitions Committee 1992-1994.

University

- Graduate Council, 1990-92.
- Petitions Council, 1993-1994.
- WSU Regents Graduate/Professional Fellowship Review Committee, 1994.

■ BOARD ROLES

Board Member, INTERAlliance (K-12 Tech Talent Alliance), Cincinnati OH (2018 - 2026)

Board Member, CS71 (Rural KY Tech HS Initiative), (2021 - 2024)

Board Member, UpTech Business Accelerator, Covington KY (2015 - 2019)

SCHOLARLY ACTIVITY

■ REFEREED PUBLICATIONS

K. Kirby, "Informatics: Know How Your Information is Being Shared." In J. Ferrante (Ed.) *How to Respond to a Pandemic: 25 Ideas from 25 Disciplines*. SAGE Press (2020). [invited]

J.A. Lamb, A. DiBello, G. Mackin, K. Kirby, and C. Acosta. "Modeling the effects of reserve size and fishing mortality for Caribbean queen conch." *Aquatic Conservation* 22:6 (2012): 721-730.

A. Moore and K. Kirby. "Reimagining Time in Computing: Reservoirs and Aural Arithmetics". *Proc. History and Philosophy of Computing* (Conference), Ghent University, Nov. 2011.

K. Kirby, J. Walden, R. Garns, M. Doyle, "The Great Chains of Computing: Informatics at Multiple Scales." *Proc. Foundations of Information Science*, Beijing, August 2010.

K. Kirby, "Putnamizing the Liquid State". *North American Conference on Computing and Philosophy* (NACAP 2009).

A. Bretto, C. Jaulin, K. Kirby. "Algebraic Graphs and Hypergraphs." *Discrete Applied Mathematics*, 30 (2008): 153–158.

M. Doyle, K. Kirby, G. Newell. "Engaging Constructions: Family-Based Computing Experiences for Immigrant Middle School Students." *Proceedings, ACM SIGCSE 2008*, pp.58–62.

A. Bretto, C. Jaulin, K. Kirby, and B. Laget, "G-Graphs and Algebraic Hypergraphs." *Electronic Notes in Discrete Mathematics* 30 (2008): 153–158.

K. Kirby, "Beyond the Celestial Sphere: Oriented projective geometry and computer graphics." *Mathematics Magazine*, Vo. 75 No. 5, pp. 351-366. (December 2002).

K. Kirby, "Biological Adaptabilities and Quantum Entropies." *BioSystems* 64, pp.31-41 (2002).

- J. Westrick, K. Kirby, and M. Kannan, "Optimizing Drinking Water Treatment Using Neural Networks." *Proceedings, American Water Works Association Water Quality Technology Conference* (Nov. 11–15, 2001).
- S.-M. Baek, J.-W. Choi, S.-C. Kim, H.K. Rim and K. Kirby, "An Efficient Connection Scheduling Technique for Hosting Internet Services on a Cluster of Servers." In M.H. Hamza, Ed., *Applied Informatics: Networks, Parallel and Distributed Processing and Applications: Software*. Proceedings of the IASTED International Symposium. (Acta Press, 2001).
- K. Kirby. "Exaptation and Torsion: Toward a Theory of Natural Computation". *BioSystems* 46, pp. 81-88. (1999).
- K. Kirby. "Of Neurons, Memories, and Rank-One Corrections." *College Mathematics Journal* Vol. 28 No. 1, pp. 2–19. (January/February 1997).
- K. Kirby. "Excess, Locality and the Meaning Bath." Position paper, Fetzer Institute *Workshop on Quantum Mechanics and Consciousness Studies*, Kalamazoo, August 31 - September 1995.
- K. Kirby. "Hermeneutics and Biomolecular Computation." *Optical Memory and Neural Networks*, Vol. 4 No. 2, pp.111-117 (1995).
- K. Kirby. "Group Selection and Cognitive Infrastructure in a Resource Gathering Problem", *Proceedings 2nd Annual Conference on Evolutionary Programming* (San Diego, Feb. 1993), pp. 137-143.
- K. Kirby. "Chaos and Conformational Syntax", *Int'l Conference on Fuzzy Logic and Neural Networks*. Iizuka, Japan, 1992.
- K. Kirby. M. Conrad and R. Kampfnier, "Evolutionary Learning in Reaction-Diffusion Neurons", *Applied Mathematics and Computation*, Vol. 41, pp. 233-263. (1991).
- K. Kirby. "Duality in Sequential Associative Memory: A Simulationist Approach", *Proceedings, IEEE International Conference on Systems Engineering*, pp. 351-354. (1991).
- K. Kirby and N. Day. "Context Dynamics in Neural Sequential Learning" *Proceedings of the Florida Artificial Intelligence Research Symposium*, pp. 66-70 (1991).
- K. Kirby and N. Day. "The Neurodynamics of Context Reverberation Learning." *Proceedings, IEEE Conference on Engineering in Medicine and Biology*, pp.1781-1782. (1990)
- M. Conrad, R. Kampfnier, K. Kirby, E. Rizki, G. Schleiss, and R. Smalz. "Towards an Artificial Brain". *Biosystems*, Vol. 23, pp. 175-218 (1989).
- K. Kirby, "On Measurement in Artificial Worlds" (Review). *Biosystems*, Vol. 23, p. 290 (1989).
- K. Kirby. "On Evolutionary Learning and Hierarchical Markov Systems" (Review). *Biosystems*, Vol. 23, pp. 169-170 (1989).
- K. Kirby. "Information Processing In the Lorenz-Turing Neuron." *Proc. 11th International IEEE Conference on Electronics in Medicine and Biology* (Seattle, November 9-12, 1989), Volume 11, 1358-1359.
- K. Kirby and M. Conrad. "Bit-Vector Optimization Algorithms For Control of Learning in Neurons With Second-Messenger Dynamics." *Proceedings of the Second Annual IEEE International Conference on Neural Networks* (San Diego, July, 1988), Volume II, pp. 55-62.

K. Kirby. "Evolutionary Learning Algorithms For Neuronal Processing." *Technical Report* CSC-88-001 (January 1988), Computer Science Department, Wayne State University, Detroit.

M. Conrad, R. Kampfner, and K. Kirby. "Neuronal Dynamics and Evolutionary Learning." In *Advances in Cognitive Science: Steps Toward Convergence*, AAAS Selected Symposium 104, H. Hastings and M. Kochen, Eds., Westview Press, Boulder, Colorado (1988), pp. 169-189.

M. Conrad and K. Kirby. "Harnessing the Inner Dynamics of Neurons for the Performance of Complex Tasks". *Proceedings of the International Symposium on Future Electronic Devices: Bioelectronic and Molecular Electronic Devices* (Fujiyoshida, Japan, December 1988).

M. Conrad, R. Kampfner, and K. Kirby. "Simulation of a Reaction-Diffusion Neuron Which Learns to Recognize Events." Appendix to M. Conrad, "Rapprochement of Artificial Intelligence and Dynamics", *European Journal of Operational Research*, Vol. 30 (1987), 280-290.

K. Kirby and M. Conrad. "Intraneuronal Dynamics as a Substrate For Evolutionary Learning." *Physica D*, Vol. 22, 150-175 (1986).

K. Kirby and M. Conrad. "The Enzymatic Neuron as a Reaction-Diffusion Network of Cyclic Nucleotides." *Bulletin of Mathematical Biology*, Vol. 46, 765-782 (1984).

M. Conrad, R. Kampfner, and K. Kirby, "Simulation of an Enzyme-Driven Computing Device." *Mid-America Electronics Conference (MAECON): Biomedical Electronics*, 15/4, 1-11 (1984).

■ SELECTED EXTERNAL SCHOLARLY PRESENTATIONS

"From Adapting to Exapting: Subverting Technology in the Transdisciplinary Classroom", Keynote Address, Kentucky Innovations Conference, May 16, 2012. [Invited]

"Educational Outreach to Hispanic Immigrants in the Midwest: An Approach through Computing." Council on Urban and Metropolitan Universities (CUMU) Conference, Baltimore, October 2007 (with H. Riffe and B. Kirby). [Refereed]

"Information-Geometric Neurocomputation in the Adaptability Paradigm". University of Southampton Science and Engineering of Natural Systems (SENSe) Group, July 2, 2006.[Invited]

"Memory, Fluctuation, Dreams: Helmholtz Machines." 1½ day workshop, Academy of Media Arts. Cologne, June 27-28, 2006. [Invited]

"State Translation and Geometries of Information and Belief". *Foundations of Information Science Conference* (Paris, July 2005). [Refereed]

Panelist, panel discussion on "Education in Information Science". *Foundations of Information Science Conference* (Paris, July 2005). [Invited]

"Probabilities, Uncertain Reasoning, and Möbius Transforms." Annual Meeting of the Kentucky Section of the Mathematical Association of America (KYMAA) Meeting, April 2, 2005. [Refereed]

“Deep Code: Object Oriented Programming and the Teaching of Mathematics.” Kentucky Council of Teachers of Mathematics Conference, October 25, 2003.[Refereed]

“Spooky Computing: How Quantum Mysteries are Shaking the Foundations of Computer Science.” Rhodes College (Memphis) Mathematics & Computer Science Colloquium, September 20, 2001.

“On Quantum Computing” Yonsei University (Seoul) Computer Science Colloquium, June 1, 2001.[Invited]

“On Quantum Computing” Korea University (Seoul) Computer Science Colloquium, April 9, 2001. [Content similar to above.]

“자바서프트웨어 개발의 3 측면” [“Three Aspects of Java Software Development”], Department of Computer Science, Sôgang University, Seoul Korea, August 1999. [Invited]

“Life Outside the System: Exaptability and a Foundation for Natural Information Processing.” *Symposium on Emergent Biology; International Society for History, Philosophy and Social Studies of Biology Meeting*, Seattle, July 1997.[Refereed]

“On the Foundations of Computer Science in Physical Hermeneutics”. *Conference on Foundations of Information Science*, Technical University of Vienna, Austria, May 1996.[Refereed]

“Neural Networks and Associative Memory: A Geometric Introduction.” One lecture delivered at four universities in Seoul Korea: Seoul National University, Sogang University, Yonsei University, and Koryo University; June 1991. [Invited]

“Neural Networks and the Deconstruction of Computer Science”, Colloquium, Systems Analysis Department, Miami University, April 1991.[Invited]

“Syntax and Superposition: Knowledge Representation in Dynamical Systems”, *IEEE Systems Engineering Conference*, Dayton, Ohio. 1990.[Refereed]

Panel member, panel discussion on “Fundamental Problems Remaining In Artificial Intelligence.” *Aerospace Applications of Artificial Intelligence, Conference*, Dayton, Ohio, October 23-27, 1989.[Invited]

“Connectivity and Continuity in Neural Associative Memory Architectures. *Great Lakes Computer Science Conference*, Western Michigan University, October 18–19, 1989. [Refereed]

“Neurocomputing by Reaction and Diffusion”. Presentation to the Institute of Advanced Manufacturing Sciences (IAMS), Cincinnati, Ohio. March 20, 1989.[Invited]

■ GRANTS

“Informatics at Multiple Scales”. **National Science Foundation** CPATH (Revitalizing Pathways to Computer Science Education), 2009-12. Amount funded: \$300,000. **Principal Investigator**.

“Build-It Trust-It Use-It: Hispanic Family IT Project.” **National Science Foundation** Broadening Participation in Computing Program, 2006-08. Amount funded: \$250,000. **Co-PI then PI**.

“Experiments in Quantum Genetic Algorithms.” NKU Center for Integrative Natural Science and Mathematics, 2002. Undergraduate research project grant with CS major Ngozi Victoria Uti.

“Optimizing Drinking Water Treatment Using Neural Networks.” NKU Center for Integrative Natural Science and Mathematics, 2000. (With J. Westrick and M. Kannan, Biological Sciences.) Amount funded: \$ 36,300. Interdisciplinary project involving three undergraduates. Worked with the Kentucky Water Service District (Fort Thomas, KY).

“Reaction-Diffusion Architectures for Sequential Associative Memory. ” **Air Force Office of Scientific Research**, 1991. **Principal Investigator**. Amount funded: \$20,000.

“Optimization By Neuronal Chaos”. Wright State University Research Incentive Award, 1989-90. Amount funded: \$1,500.

■ OTHER EXTERNAL SCHOLARLY ACTIVITY

Review Panel Member, National Science Foundation. CISE Directorate, Arlington VA, Informatics, February 25-26, 2010.

Dissertation Committee member, S. Strunjas, “Routing, Ranking and Content Summarization in Peer-to-Peer Networks.” Computer Engineering, University of Cincinnati, 2005–2008.

Dissertation Committee member, Y. Li, “High Performance Text Document Clustering.” Computer Science and Engineering Department, Wright State University, 2005–2007.

Program Committee member, Third Conference on the Foundations of Information Science (Paris, 2005).

Participant, “ORESME” Kentucky-Ohio-Indiana history of mathematics seminar, 2001 – *present*.

Special referee for the journal *Neurocomputing*, for an issue on neural evolutionary programming. Reviewed six papers, Fall 2000.

Technical committee member, 2001 *IEEE Conference on Evolutionary Computation*. Refereed four papers, Fall 2000.

Co-Editor, Special Issue of the journal *Biosystems* (Vol. 45, No. 1–2, 1997), Foundations of Information Science: The Quest for a Unified Theory of Information.

Editorial board member, *BioSystems* (an interdisciplinary journal of biological information processing), 1994-2000. Reviewed papers submitted for publication in the areas of computability and artificial intelligence. Continued to serve as reviewer through 2004.

Ph.D. committee member for Wright State University doctoral candidate in Computer Science, Devert Wicker. I was his Ph.D. advisor until I left WSU in 1994. I reviewed his dissertation and attended his defense in October 1998.

Chief editor, *BioSystems* special issue on *Foundations of Information Science: The Quest for a Unified Theory of Information* (Vol 46. Nos. 1,2; 1998).

Provided Mathematica code for visualizing the singular value decomposition to D. Kalman, for use in his *College Mathematics Journal* article “A Singularly Valuable Decomposition: The SVD of a Matrix” (January 1996). This Mathematica code also generated the cover illustration.

Program committee member, *Conference on Evolutionary Programming* (San Diego, 1995).

■ NKU-INTERNAL SCHOLARLY ACTIVITY (in part)

“Preliminaries on the Current State of AI.” Invited presentation, Northern Kentucky Law Review Symposium on AI and the Law. March 2022.

“Helmholtz Machines and Information Geometry.” NKU Physics Colloquium, October 2005.

Organizer, NKU Reading Group in Probabilistic Artificial Intelligence. Spring 2005.

“A Biocomputing Sampler.” Part of a series of interdisciplinary overviews organized by NKU Center for Integrative Natural Science and Mathematics (CINSAM). October 1, 2003.

Co-organizer, NKU Reading Group in Cognitive Neuroscience. With M. Bardgett (Psychology) and R. Garns (Philosophy). Fall 2002 – Spring 2003.

“Work in progress: Exterior algebra and oriented projective geometry.” Presentation to mathematics & physics faculty, December 13, 2001.

“Spooky Computing: How Quantum Mysteries are Shaking the Foundations of Computer Science” NKU CINSAM Colloquium, November 13, 2001.

“Sex, Mutants and Computers: Solving Problems Using Darwinian Algorithms”. NKU CINSAM – Sigma Xi Colloquium, January 26, 2000.

“Strange Computing: Genetic, Neural and Quantum Algorithms.” CINSAM meeting, April 1999.

“Artificial Intelligence: Can Computers Think and Behave as Humans Do?”, with R. Garns (Philosophy) and C. McDaniel (Psychology). Sponsored by NKU Philosophy Club. (Fall 1997).

“Artificial Intelligence and Consciousness”. Talk to NKU Philosophy Club (Fall 1996).

Leader, Symplectic Geometry Seminar, NKU Mathematics and Computer Science Department, 1994-96.

TEACHING

■ COURSES TAUGHT

Northern Kentucky University, 1994 – present

MAT 119	<i>Pre-Calculus Mathematics</i>
HNR 303	<i>Honors Seminar: The Search for the Perfect Language *</i>
HNR 304	<i>Honors Seminar: The Extremes of Language*</i>

HNR 49X	<i>Honors Capstone Supervision</i>
INTL 300	<i>International Service Learning (Mexico City)*</i>
INF 120	<i>Elementary Programming: Media Python*</i>
INF 128	<i>Principles of Informatics*</i>
INF 260	<i>Object Oriented Programming I</i>
CSC 360	<i>Object Oriented Programming II</i>
CSC 333	<i>Systems Programming</i>
CSC 364	<i>Data Structures and Algorithms</i>
CSC 392	<i>Research Project in Computer Science</i>
CSC 402	<i>Advanced Programming Methods**</i>
CSC 425	<i>Artificial Intelligence</i>
CSC 440/540	<i>Software Engineering*</i>
CSC 444/544	<i>Object-Oriented Software Development **</i>
CSC 480/580	<i>Computer Graphics **</i>
CSC 485/585	<i>Theory of Computation</i>
CSC 494/594	<i>Topics: Windows Programming *</i>
DSC 494	<i>Topics in Data Science: Deep Learning*</i>
CSC 501	<i>Intermediate Programming Workshop</i>
CSC 601	<i>Advanced Programming Workshop *</i>
CSC 680	<i>Advanced Computer Graphics *</i>
CSC 685	<i>Logic and Computation**</i>

Wright State University, Department of Computer Science and Engineering (1988-1994)

CS 208,209	<i>Introduction to Computer Programming in C for Business I,II *</i>
CS 240,241,242	<i>Computer Science I,II,III</i>
CS 400/600	<i>Data Structures and Software Design</i>
CS 410/610	<i>Theory of Computation</i>
CS 466/666	<i>Formal Language Theory</i>
CS 470/670	<i>Systems Simulation **</i>
CEG 616	<i>Matrix Computations *</i>
CS 765	<i>Foundations of Neurocomputing *</i>

* Developed as new course

** Significantly redesigned existing course

■ STUDENT RESEARCH SUPERVISION (NKU)

Stein-Funded Biocomputing Project: Hallucination, Embodied Cognition, and the Conrad Tradeoff Principle in Tera-Scale Generative AI; Taraneh Wilkinson (2025-26).

Honors Capstone Project: Large Language Model Recognition of Common, Uncommon, and Abstract Languages; Ben Lambert (2023).

Directed Research in Computer Science: The Roots of Hallucination in AI and Dynamical Systems; Taraneh Wilkinson (2023).

Honors Capstone Project: A Constructed Language Violating Identified Universal Constraints; Megan Taylor (2022).

Directed Study / Stein Biocomputing Research Projects in Reservoir Computing: Tobel Atnafu (2020).

Honors Capstone Project: Deep Reservoir Computing and Recurrent Neural Networks. Parker Kain (2019).

Directed Study / Stein Biocomputing Research Projects Deep Learning: Tobel Atnafu, Endalkachew Teklemichael (2019).

Directed Study / Stein Biocomputing Research Projects in Convolutional Neural Networks: Kirby Owens, Lauren Hensley, Benjamin Bourgeois, Brian Konzman (2015-16).

Graduate Directed Study: Computational Gene Prediction. Katie Dwyer (2009).

Honors Capstone Project: “Bilingualism and the Mind.” Liz Osborne (2007).

Undergraduate research project: “A 3D Role-Playing Game with Custom Physics-Geometry Engine” L. Brun and W. Eddins, Spring 2005.

NKU Honors Thesis Project: “Network Metaphors: From Ant Optimization to Virtual Communities.” Phil Ulrich (2004-05).

Undergraduate research project: Simulation Software for Marine Harvest Refuge Assessment (R. Cannon), Spring 2004.

Directed Study: Projective Geometry (P. Wilson, J. Pratt), Fall 2003.

Directed Study (Graduate): Computer Vision and Multiple View Geometry (V. Shekar), Spring 2003.

Directed Study / CINSAM undergraduate research project: Genetic Algorithms and the Knapsack Problem. N. Victoria Uti, 2002.

Directed Study: Advanced Computer Graphics for Game Development (P. Wilson, W. Haggard, V. Kasilingam), Spring 2002.

Directed Study / CINSAM undergraduate research project: Developing a neural network for optimizing treatment for turbidity in drinking water. Michelle Barker.

“Object Oriented Virtual Robotics.” NKU Honors Thesis Project. Nathan DeGroff. (1998–99).

“IcoCrystal: A 3D Graphics Game for Mathematics Education.” James Phillips, Greaves student summer research project. (1995).

■ EXTERNAL TEACHING

Seminar in Java for Computer Engineers (2000-2001). Sogang University (Seoul), Computer Science Department. Sabbatical appointment.

Object-Oriented Software Design (1994). Earlham College (Indiana). This was a senior special topics course I taught as a visiting instructor while a faculty member at Wright State University.

Neural Network Familiarization Workshops I-IV (1989-1991)

Neural Network Applications Workshops I-IV (1991-1993)

These were two- and three-day workshops taught at the Miami Valley Research Institute's Intelligent Systems Applications Center (formerly "Center for AI Applications"). I taught the first series with faculty at the University of Dayton; I taught the second series solo. The audience consisted of professionals from local companies and Wright-Patterson AFB.

■ OTHER TEACHING-RELATED WORK

Workshop Leader and Developer, *Taste of Deep Learning*, NKU Informatics+ Inaugural Mini-Workshop Series, July 16, 2021. An overview for career changers, featuring examples from 84.51 and NKU.

SOAR mentor for three students. (SOAR: Scholarships, Opportunities, Achievement, Results; and NSF-funded STEM program), 2009-10.

Co-developer of NKU minor in Neuroscience, 2005. Faculty participant, BIO 494 *Neuroscience Seminar*. Attended workshop *Neuroscience and the Humanities* at Allegheny College, June 2005, as part of the design process.

Co-leader (with S. Rankin), *Java for AP Computer Science Teachers Workshop*, NKU, June 17–27, 2003.

Innovations introduced to the NKU computer science curriculum:

- TensorFlow system for deep learning artificial intelligence / data science course (2018)
- Alloy model-checking software for use in graduate computer science courses (2006).
- Python media programming as an introduction to computing (2006), made into a general education course (2009).
- Use of a Beowulf cluster computer and MPI parallel programming, in CSC 333 (2002).
- The C# language, in CSC 444 (2002).
- The Java programming language (1997); later adopted for use in introductory programming.
- Event-based graphical user interface programming in Windows (1995).
- The OpenGL (1995) and DirectX (2002) 3D graphics programming interface.

Reviewer, programming textbook proposal (John Jagger, *Programming in C#*) for Wiley.

Talks to the NKU student chapter of the ACM and Mathematics/Computer Science Club.

- On artificial intelligence (1996)
- On employment in computer science (1997)

"Java for Unbelievers." Department Colloquium, October 1999.

Head judge, ACM Midwest Regional Programming Contest, Dayton, Ohio, 1989.

■ MISCELLANEOUS

Columnist, *Hanguk Ilbo* (US Edition). In Korean. 2007-2009.