Vita

David J. Eck

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Employment:

1996–2022	Professor of Mathematics and Computer Science Hobart and William Smith Colleges, Geneva NY
1988–1996	Associate Professor of Mathematics and Computer Science Hobart and William Smith Colleges, Geneva NY
1986–1988	Assistant Professor of Mathematics and Computer Science Hobart and William Smith Colleges, Geneva NY
1982–1986	Assistant Professor of Mathematics State University of New York at Buffalo
1980–1982	John Wesley Young Instructor in Mathematics Dartmouth College, Hanover NH

Education:

Ph.D.	Mathematics	1980	Brandeis University, Waltham MA
M.A.	Mathematics	1977	Brandeis University, Waltham MA
B.S.	Mathematics	1975	Allentown College, Center Valley, PA [renamed to DeSales University]

Publications:

The Most Complex Machine: A Survey of Computers and Computing. A K Peters, Wellesley MA, 1995.

"Natural Sheaves." *Illinois Journal of Mathematics.* Vol. 31, No. 2, 1987. Pages 200–207.

"Product-preserving Functors on Smooth Manifolds." *The Journal of Pure and Applied Algebra.* No. 42, 1986. Pages 133–140.

"Invariants of k-jet Actions." *Houston Journal of Mathematics.* Vol. 10, No. 2, 1984. Pages 159–168.

Gauge-natural Bundles and Generalized Gauge Theories. Memoirs of the American Mathematical Society, Vol. 33, No. 247, 1981.

Self-Published:

Introduction to Programming Using Java, a free on-line textbook, available at https://math.hws.edu/javanotes (Version 1, 1995; Version 9.0, 2022).

Foundations of Computation, with Carol Critchlow, a free introductory computer science theory textbook, available at https://math.hws.edu/FoundationsOfComputation (Version 2.3, 2010).

Introduction to Computer Graphics, a free on-line textbook for use in an upper level computer graphics course, available at httsp://math.hws.edu/graphicsbook (Version 1, 2015; Version 1.3, 2021).

Selected Software:

Java Components for Mathematics, a framework for mathematical applets (2001).

xFunctions, a Java program for learning about functions, primarily for use in calculus courses (1999).

xSortLab, https://math.hws.edu/eck/js/sorting/xSortLab.html, a visualization of several sorting algorithms.

Mandelbrot Viewer, https://math.hws.edu/eck/js/mandelbrot/MB.html, for visualization of the Mandelbrot set.

Turing Machine Simulator, https://math.hws.edu/eck/js/turing-machine/TM.html.

Genetic Algorithms Demo, https://math.hws.edu/eck/js/genetic-algorithm/GA.html.

Wallpaper Groups, https://math.hws.edu/eck/js/symmetry/wallpaper.html, for drawing symmetryic patterns in the plane.

Courses Taught Since Fall 2010:

Math 110: Discovering in Mathematics
Math 130: Calculus I
Math 131: Calculus II
Math 135: First Steps into Advanced Mathematics
Math 204: Linear Algebra
Math 331: Foundations of Analysis
Math 448: Complex Analysis
Cpsc 120: Principles of Computer Science
Cpsc 124: Introductory Programming
Cpsc 225: Intermediate Programming
Cpsc 229: Foundations of Computation
Cpsc 327: Data Structures and Algorithms
Cpsc 424: Computer Graphics
Cpsc 431: Operating Systems
Cpsc 441: Networking and Distributed Processing

Independent Studies Supervised Since Fall 2010:

"Web Site Programming Project: A New Departmental Web Site," Fall 2010.
"High-Performance Computing on GPUs, using OpenCL," Fall 2010.
"Web Site Programming," Fall 2011, Spring 2013, and Fall 2013.
"Exploring Affiliate Marketing Fraud," Fall 2013.
"Using AI Techniques to Detect Affiliate Marketing Fraud," Spring 2014.
"Web Site Programming with PHP and MySQL," Spring 2014.
"Web Site Design and Implementation," Spring 2014.
"Web Site Programming with JSP and MySQL," Spring 2014.
"Differential Forms in Algebraic Topology," Fall 2014.
"Quantum Computing," Fall 2015.
"Concrete Math / Automata Theory," Fall 2015.
"Web Site Programming with JSP, Servlets, and MySQL," Fall 2016.
"Fractals: Math and Music," Fall 2016.
"Developing a Game Engine with DirectX," Spring 2017.
"C Programming," Spring 2018.
"Computer Graphics Rendering: Theory and Practice," Fall 2018.
"Web Site Programming with PHP and MySQL," Spring 2019.
"Contributing to an open source astronmy project:
Refactoring legacy code for echelle spectra," Spring 2020.
"Computer networking and the internet protocol stack," Spring 2020.
"Developing a framework for financial data analysis," Spring 2020.
"Web Site Programming with PHP and MySQL," Fall 2021.

Honors Projects Supervised:

The Formal Syntax and Semantics of Programming Languages,
William Merrick, 1987-88.

The Mathematics of Musical Sound Synthesis,
Malcolm Gately, 1988-89.

Nonlinear Dynamics and Chaos,
David Martin, 1988-89.

Differential Geometry and the Geometrization of Physics,
Vincent Cassano, 1989-90.

Database Theory, Implementation, and Applications,
Jim La Monica, 1990-91.

Fractals, Fractional Dimension and Iterated Function Systems,
Scott Davidson, 1991-92.

The Mathematics of the Mind: Semantics, Language and the Nature of Intelligence,
Nathaniel Poor, 1991-92.

Genetic Algorithms: Using Computers to Simulate Evolution and Solve Hard Problems, Hiroki Kobayashi, 1996.

Network Security,
Dominik Weis, 1998.

The Genetic Algorithms Approach For Finding Approximate Solutions to NP-Complete Problems,
Oscar Barney, 2003-04.

Using the Genetic Algorithm to Evolve Cooperative Behavior,
Evan Hourigan, 2003-04.

MathOML: An XML Languge for Visualization of Mathematical Objects,
Joshua Davis, 2009-2010.

ISTAT: Online Interface for Hypothesis Testing and Statistical Analysis,
Shaun Viguerie, 2011-2012.

Online Virtual Math Museum: Building a Virtual Math Museum with Modern Web Technologies and an XML Infrastructure, Alex Kittelberger, 2012-2013.

ScoutPlus: A Web Application for the Development of Advanced Hockey Analytics,
Frank Oplinger, 2017-2018.

Award:

Hobart and William Smith Colleges Faculty Prize for Teaching, 2019.

Grants:

- Principal Investigator, National Science Foundation Instrumentation and Laboratory Improvement grant number USE-9051583, "Microcomputers for Laboratory Work in Introductory Courses in Computer Science and Mathematics," May 1990. Grant amount: $34,251.
- Principal Investigator, National Science Foundation Instrumentation and Laboratory Improvement grant number USE-9151129, "Macintosh Lab on Wheels," September 1991. Grant amount: $7,748.
- Co-principal Investigator, National Science Foundation Instrumentation and Laboratory Improvement gram number DUE-9551672, "Workstation Laboratory for Computer Science Curriculum Enrichment," September 1995. Grant amount: $15,305.
- Principal Investigator, National Science Foundation Course, Curriculum, and Laboratory Improvement grant number DUE-9950473, "Mathbeans: Mathematical Software Components for Web-based Instructional Material," May 1999. Grant Amount: $59,578.