Curriculum Vitae

Scott R. Franklin, Ph.D.

Associate Professor of Practice, Computer Science
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Profile

A highly motivated Associate Professor of Practice in Computer Science with a Ph.D. in Mathematics and M.S. in Computer Science with extensive experience in academia and university leadership. Seeking opportunities to contribute expertise in Computer Science and Mathematics in a post-secondary educational or research setting.

Education

Ph.D. in Mathematics ..... **May 2005**
Texas Tech University
Specialization: Numerical Analysis (Multi-field Finite Element Methods)

M.S. in Computer Science, ... **December 2023**
Georgia Institute of Technology
Specialization: Machine Learning

M.S. in Applied Mathematics ..... **August 2000**
Texas Tech University

B.S. in Mathematics, Magna Cum Laude ..... **May 1998**
Wayland Baptist University

Work Experience

Texas Tech University, Lubbock, TX ..... **July 2024 - present**

Associate Professor of Practice of Computer Science (July 2024 – present)

Duties: Teach courses in undergraduate and graduate computer science with special expertise in Scientific Computing and Machine Learning; Curriculum development in undergraduate and graduate computer science.

Wayland Baptist University, Plainview, TX ..... **August 2000 – June 2024**

Professor of Computer Science and Mathematics (July 2019 – June 2024)

Duties: Teach courses in Programming Principles (Java, Python), Data Structures, Algorithm Analysis, Web Programming (HTML, CSS, JavaScript, PHP, SQL), Design of Database Systems (MySQL), Numerical Methods (Matlab), Software Engineering (SDLC, Agile). Programmatic oversight of Computer Science program, curriculum development, hiring/coordinating adjunct instructors in CS, budgeting for CS Department, student academic advising, instruction of face-to-face and online CS courses, advising undergraduate research projects, grant authoring and administration.

Dean of the School of Mathematics and Sciences (February 2015 – August 2019)

Duties: Programmatic oversight of all science and mathematics degrees (academic program review, SACSCOC accreditation, strategic planning), Budget planning and tracking for School of Math and Sciences (~$1.2 million annual), Supervise personnel (15 full-time faculty, 5 adjunct, 3 administrative staff), University service (committees and councils), Extramural funding oversight (grants and donations)

Professor of Mathematics (July 2015 – June 2019)

Duties: Teach courses in College Algebra, Trigonometry, Calculus I-III, Linear Algebra, Differential Equations, Numerical Analysis, Intermediate Analysis

Director of the Virtual Campus (November 2011 – February 2015)

Duties: Strategic planning for all distance learning programs at WBU, supervise staff (4 full-time, ~150+ adjunct instructors), Oversee quality standards for online delivery of courses, Liaison with technology providers (Blackboard, Kaltura, Respondus, Proctorio, etc.), University service (committees and councils), Budget planning and tracking for Virtual Campus (~$1.4 million)

Associate Professor of Mathematics (August 2010 – June 2015)
Associate Dean of the School of Mathematics and Sciences (August 2009 – November 2011)
Assistant Professor of Mathematics (August 2003 – August 2010)
Mathematics Instructor (August 2000 – August 2003)

Georgia Institute of Technology, Atlanta, GA (Online) .....August 2019 – present
Graduate Teaching Assistant, Machine Learning for Trading, College of Computing
Duties: Conduct Office Hours, Grade Projects, Provide instruction on a discussion board for online course.

Texas Tech Health Sciences Center, Lubbock, TX.....August 2009 – May 2015
Post Doctoral Research Associate, Department of Pharmacology and Neuroscience
Duties: Bioinformatics Research Consultant under direction of Dr. Susan Bergeson

Texas Tech University, Lubbock, TX.....May 1998 – December 2007
Post Doctoral Research Associate, Department of Plant and Soil Science
Under direction of Dr. Thea Wilkins (Summer, 2006; June 2007 – December 2007)
Post-Doctoral Research Associate, Department of Chemistry
Under direction of Dr. William Hase (Summer, 2005)
Graduate Research Assistant, High Performance Computing Center
(1999 – 2000; Summer, 2001; Summer, 2002; Summer, 2003)
Graduate Teaching Assistant, Department of Mathematics and Statistics (1998 – 1999)

Teaching Experience

Texas Tech University (Lubbock)
Object Oriented Programming (Java); Discrete Structures; Programming Principles (C/C++), Introduction to Mathematical Analysis, Trigonometry, Developmental Mathematics

Wayland Baptist University (Plainview, Lubbock, Amarillo, and Online)
Computer Science: Programming Principles I/II, Object Oriented Programming, Data Structures, Web Programming, Concepts of Database Systems, Survey of Programming Languages, Software Engineering I, Design and Analysis of Algorithms, Data Science Tools
Mathematics: Developmental Mathematics, Intermediate Algebra (face-to-face and online), College Algebra (face-to-face and online), Trigonometry (face-to-face and online) Elementary Statistics, Calculus, Linear Algebra, Vector Mechanics, Differential Equations, Mathematical Modeling with Scientific Computing, Intermediate Analysis, Numerical Analysis, Cryptography.
Other: Faith & Science Seminar, Three-Dimensional Printing, Computer Competency

Awards & Grants

Xcel STEM Education Grant (2018 - 2024) - $33,500
Grant Director. The grant provides support for the Pioneer Maker Academy offering workshops for middle school and high school students to learn 3d modeling and printing to promote interest in STEM careers

NOYCE Teacher Scholarship Program - NSF (2022-2026) - $1.36 million
"Growing STEM Educators through Science Research on the South Plains of Texas"
Role: Faculty Coordinator of Pioneer Maker Academy, a summer STEM workshop training future educator to utilize 3D scanning and printing technology in their classrooms

Faculty Community Service Award (2019-2020, 2020-2021)
The Faculty Community Service Award is given to a faculty member who provides exceptional service to

the community. This service is exhibited through church involvement, service to civic organizations, boards, agencies, or committees as well as many other areas of volunteer work

Teacher Quality Grant (2012 – 2014)

Role: Lead Instructor**.** This grant provided area junior high and high school algebra teachers with iPads and supplemental technology to enhance instruction in their classroom.

Distinguished Young Alumni Award (2013)

Awarded by the Association of Former Students at Wayland Baptist University on October 11, 201

Piper Professor Nominee, Wayland Baptist University (2011 – 2012)

This award honors professors for their dedication to the teaching profession and for their outstanding academic, scientific, and scholarly achievement. The purpose of these awards is to give recognition to the teaching profession rather than to research, publication, administration, or other such related activity, although, these criteria will also be considered. Wayland nominates one full-time faculty member per year.

Faculty Scholarship Award, Wayland Baptist University (2010 – 2011)

The Faculty Scholarship Award is given to a faculty member who has been successful in one or more of the following areas: published a research paper, a learned journal or book related to the faculty member's subject area; delivered a paper or given an address at a professional society meeting; created a work of art or a musical composition of merit; or improved academic credentials through research, coursework, or self-study.

Undergraduate Research

Sean Fitzgerald (B.S. Computer Science, Wayland Baptist University) ..... **December 2023**
Research Topic: "Q-Learning and Bitcoin trading"

Christian Ortega (B.S. Computer Science, Wayland Baptist University) ..... **May 2024**
Research Topic: "Decision Trees and Random Forests in Stock Trading Application"

Ilan Joffe (B.S. Computer Science, Wayland Baptist University) ..... **May 2023**
Thesis: "Does Genre Mean Anything: Classifying Music with Artificial Intelligence"

Brian Adamson (B.S. Mathematics, Wayland Baptist University) ..... **May 2014**
Thesis: "Knot Selection in Least Squares Approximation with Free Knot Splines"

Jarrod Alford (B.S. Mathematics, Wayland Baptist University) December 2010
Thesis: "The Deployment of Wayland Baptist University's First Computational Cluster with Applications in Bioinformatics"

Zackery Gibson (B.S. Mathematics/Pre-Engineering, Wayland Baptist University) ..... **May 2010**
Thesis: "On the Deployment of a Low-Cost Computational Cluster for Integration in Undergraduate Education"

Joel O'Hair (B.S. Mathematics, Wayland Baptist University) ..... **May 2006**
Thesis: "Portfolio Optimization: A Comparison of Methods and Exploration of Different Estimators of Return and Measures of Risk"

Sean McVey (B.S. Mathematics, Wayland Baptist University) ..... **May 2005**
Thesis: "Weighting Control Nets of Tensor Product Splines to Enhance Computer Generated Images (CGI)"

Christopher Gonce (B.S. Mathematics, Wayland Baptist University) ..... **May 2005**
Thesis: "Parameterization Techniques for Improving Scattered Data Approximation"

Research Interests

Machine Learning – Reinforcement Learning & Computer Vision (Applications in Game Design and Finance), Physics Informed Neural Nets (PINNs)
Integrating Technology in the Classroom (3D Printing and Collaborating Coding)
Multi-field finite element methods for domain decomposition
Data fitting using spline methods
Stochastic partial differential equations
Bioinformatics (Microarray expression)

Research Experience

Bioinformatics / Data Analysis

- Developed and deployed new software tools for analysis of genomic data, including scaffolding for sequencing genomes
- Identification of cell wall genes in other plants by comparison to known cell wall genes in cotton
- Differential expression analysis on microarray data (Agilent technology)

Molecular Vibration Simulation

- Development and implementation of molecular motion to isolate vibration/rotation/translational energy
- Deployment of models in high performance computing environment

Multi-Field Finite Element Methods
Doctoral Dissertation

- Implementation of three-field domain decomposition methods using finite element methods
- Application of domain decomposition to stochastic partial differential equations and parabolic (time-dependent) models
- Benchmarking parallel implementations of PDE solvers on high performance computing systems (distributed memory and grid systems)

SBCCOM (Soldier and Biological Chemical Command)

- Development of simulated real-time biological and chemical contaminant dispersal in gaming environments for training

Data Fitting using Spline Methods
Research Assistant and Post Doctoral

- Development and implementation of variable knot spline approximations using least squares on high performance computing systems
- Implementation of parametric approximation of multi-dimensional data using orthogonal distance regression (ODR) splines (univariate and bivariate)
- Development 3D surface visualization software for use in a virtual reality theatre
- Comparative studies of ODR spline methods using various initial parameterization methods and with various weight distributions for Non-Uniform Rational B-Splines (NURBS)
- Benchmarking spline methods using various parallel sparse matrix solvers

High Performance Computing
Research Assistant and Post Doctoral

- Fluency in each of the following programming languages and resources:
  Python, C, C++, C#, Perl, PHP, MySQL, FORTRAN, Java, Matlab, Maple, VBScript, JavaScript, HTML, XML, ASP (Active Server Pages), UNIX shell programming, MPI, OpenMP, Avaki Grid, OpenGL.
- Implemented and benchmarked various parallel sparse matrix solvers including MUMPS, SuperLU, UMFPACK, and DPSLDLT/DPSLDU (SGI-native solvers).
- Utilized MPI and OpenMP for parallelization of code.
- Implemented 3D visual models in OpenGL for interactive simulations.
- Demonstrated the 3D visual capabilities of the virtual reality theatre at the High-Performance Computing Center of Texas Tech University for various tour groups and VIPs.
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Professional Affiliations and Service

Mathematical Association of America, Member and Dept. Liaison ..... 2015 – present
Texas Academy of Science ..... 2019 – present

- Chair, Mathematics/Computer Science Section (2019)
- Vice Chair, Mathematics/Computer Science Section (2018, 2023)

Association of Computing Machinery ..... 2020 – 2022
Member, American Scientific Affiliation 2015-2017
Texas Distance Learning Association 2011-2015

- Board Member (2014-15)

United States Distance Learning Association 2011-2015
Texas Blackboard Users Group 2011-2015

University Service

Pioneer Maker Academy (3D printing Lab), Director ..... **2018 - present**
Technology Committee, Chair ..... **2004 – 2005, 2009 – 2011, 2019 – 2021, 2023 - present**
Education Faculty Search Committee ..... **2023 – present**
Institutional Review Board ..... **2022 – 2023**
Rotaract Club of Wayland Baptist University, Sponsor ..... **2019 – 2022**
Core Curriculum Committee ..... **2020 – 2022**
Doctoral Management Faculty search committee ..... **2019 – 2020**
Ad-hoc Faculty Grievance Committee, Chair ..... **2014 – 2015, 2018 – 2019, 2019 – 2020**
Academic and Graduate Council, BAS Committee ..... **2011 – 2019**
Virtual Campus Council, Chair ..... **2012 – 2015**
Benefits Committee, Chair ..... **2010 – 2011**
Freshman class, Faculty Sponsor ..... **2009 – 2010**
Pi Sigma Sigma – Math and Science Club, Faculty Sponsor ..... **2004 – 2007**
Faculty Senate, Senator and Executive Committee Secretary ..... **2003 – 2004, 2006 – 2007**
Academic Standards Committee, Chair ..... **2004 – 2006**
Website Task Force ..... **2005 – 2006**
Scholarship and Financial Aid Committee ..... **2000 – 2002**
Athletics Committee, Wayland Baptist University ..... **2000 – 2002**

Other Committee Service includes serving on ad hoc committees to develop social media policy, revise general education core outcomes, conduct annual tuition study, consider student grade appeals, and consider faculty promotion appeals.

Community Service

Girls Who Code (club for 6-12 grade girls to learn programming), Facilitator ..... **2020 – present**
YMCA Board ..... **2019 – present**

- Vice President/President Elect (2023 – 2024)
- President (2024 – Present)

Rotary Club in Plainview ..... **2014 – present**

- Immediate Past President / Public Relations Chair (2023 – 2024)
- President (2022 – 2023)
- President Elect and Administration Committee Chair (2021 – 2022)
- President Nominee and Service Chair (2020 – 2021)
- Board Member – Service Chair (2016 – 2019)
- Foundation Committee, Coordinator of Weekly Foundation Raffle (2015 - 2017)
- Service Committee, Coordinator of Annual Dictionary Distribution (2015 – 2019)

First Baptist Church of Plainview, TX ..... **2000 - 2023**

- Deacon Nominating Committee (April 2022 – 2023)
- Chairman of Deacon Board (April 2020 – March 2022)
- Deacon (2013 - present)
- Sunday School Teacher, 5th and 6th Grade (2009 – 2023)
- Community Missions Committee (2020 – present)
- Youth Committee (2019 - 2020)
- Chair, Personnel Committee (2013-2015)
- Chair, Budget Planning Committee (2012)
- Sunday School Directors for the Young Married Couples class (2002 – 2007)

Hale County Child Welfare Board, Treasurer ..... **2005 – 2007**

Publications

Journal Publications

- Rajiv G. Agrawal, Julie A. Owen, Patricia S. Levin, Aveline Hewetson, Ari E. Berman, Scott R. Franklin, Ryan J. Hogue, Yukun Chen, Chris Walz, Benjamin D. Colvard, Jonathan Nguyen, Oscar Velasquez, Yazan Al-Hasan, Yuri A. Blednov, Anna-Kate Fowler, Peter J. Syapin and Susan E. Bergeson. "Bioinformatics Analyses Reveal Age-Specific Neuroimmune Modulation as a Target for Treatment of High Ethanol Drinking." Alcoholism: Clinical and Experimental Research Vol. 38, Issue 2, pp. 428-437. February 2014.
- RG Agrawal, S Balaraman, JA Owen, PJ Syapin, A Hewetson, Scott R. Franklin, RC Miranda, S Bergeson. "Potential Role of MicroRNAs in regulating Ethanol-Mediated, Age-Dependent Brain Changes." Alcoholism: Clinical and Experimental Research Vol. 36, pp. 428-437, 2012
- Franklin, Scott R.; Seshaiyer, Padmanabhan; and Smith, Philip W. "A three-field finite element method for elliptic partial differential equations driven by stochastic loads." Stoch. Anal. Appl. 23 (2005), no. 4, 757--783
- Franklin, Scott R.; Seshaiyer, Padmanabhan; and Smith, Philip W. "A computational methodology to study coupled physical processes over partitioned domains." Applied Mathematical Modelling. 31 (2006), no. 3, 632-646.

Conference Proceedings

- Franklin, Scott R.; Seshaiyer, Padmanabhan; and Smith, Philip W. "On the parallel implementation of the three-field finite element method for coupled parabolic systems." Proceedings of the Joint DCABES and ICPACE meeting on distributed algorithms for science and engineering, (2005).
- Franklin, Scott R.; Seshaiyer, Padmanabhan; Perez, Jerry; and Smith, Philip W. "A grid implementation for domain decomposition in solving stochastic partial differential equations." Proceedings of CE2005. (2005)
- Franklin, Scott R.; Seshaiyer, Padmanabhan; and Smith, Philip W. "A computational methodology to study coupled physical processes over partitioned domains." Proceedings of the International Conference on Computing, Communications, and Control Technologies (CCCT-2004), Austin, TX, (August 14-17, 2004).

Dissertation/Thesis

- "A computational three-field methodology for non-conforming finite elements over partitioned domains". Doctoral Dissertation, Texas Tech University, Lubbock, TX. (2005).
- "Parametric approximation of data using orthogonal distance regression splines." Master's Thesis, Texas Tech University, Lubbock, TX, (2000).

Presentations and Workshops

- Presentation: "3D Printing with Artificial Intelligence", NOYCE Grant Science Night, November 7, 2023
- Presentation: "STEM is my Superpower", E-Sports Festival at Wayland Baptist University, April 28, 2023
- Presentation: "From Dreams to Reality: Real Life Replicators using AI and 3D printing", NOYCE Grant Science Night, April 17, 2023
- Workshop: "Designing 3D models for 3D printing" – Girls Who Code: 2022 (10 sessions in Fall semester)
- Workshop: "Beginning Python Programming your own ChatBot" – Girls Who Code: 2021 – 2022 (20 sessions in Fall and Spring semesters)
- Workshop: "Game Development with Scratch" – Girls Who Code: 2020 – 2021 (20 sessions in Fall and Spring Semesters)
- Presentation: "Educational Apps for Flipping your Classroom with an iPad," Texas Association of Baptist Schools, Plainview, TX, February 26, 2016.
- Presentation: "Blackboard Training for Instructors" – Superintendents Training, July 22, 2015, Wayland Baptist University.
- Presentation: "Educational Apps: Teaching in the One iPad Classroom," Texas Association of Baptist Schools, Plainview, TX, February 16, 2015.
- Presentation: "Technology in the [Sunday School] Classroom." Renew the Vision (Sunday School Conference for Caprock Plains Baptist Association, September 7, 2014.
- Led numerous training workshops to WBU faculty and administrators use of iPads in the classroom, (Fall, 2013 – 2018).

- "Don't Let your Distance Faculty Miss the Professional Development Boat", Texas Distance Learning Association 2014, Galveston, TX. March 6-8, 2014.
- "Tools for Developing Engaging Online Content on Your Tablet", Texas Blackboard Users Group 2013, San Antonio, TX. October 24, 2014
- "Managing the Flow of New Features: Rolling out Blackboard Updates without Sinking the Ship", Texas Blackboard Users Group 2013, San Antonio, TX. October 24, 2013
- "Teaching in the One iPad Classroom"
  This workshop has been presented at multiple sessions at the Education Service Centers, Region 16 and 17, as well in several area school districts. (Summer, 2012 – present)
- "Digging Deeper with Advanced System Reporting", Texas Blackboard User's Group Meeting, Killeen, TX. October 25, 2012
- Presentation: "Teaching Mathematics with the Rubik's Cube." At the Panhandle Math and Science Conference, West Texas A&M University, Canyon, TX. September 24, 2011.
- MAA Mathematics Seminar Talk: "The Rubik's Cube: Solve It Like a Mathematician" at Wayland Baptist University, September 23, 2011.
- MAA Mathematics Seminar Talk: "Chutes and Ladders for the Impatient: Using Mathematics to Speed Up a Board Game" at Wayland Baptist University, January 21, 2011
- Presentation, "Developing Online Video Lectures for Online and Hybrid Algebra Courses" at the International Conference on Technology in Collegiate Mathematics (ICTCM) in Chicago, IL on March 11 – 14, 2010.
- Presentation: "Conducting an Online Mathematics Course", Wayland Baptist University, Plainview, TX, November 28, 2008
- Presentation: "EE-LIMS: A Laboratory Information Management System" and "Microarray Differential Expression Analysis in R (A Statistical Package)" to the Functional Genomics Laboratory at Texas Tech University, Lubbock, TX, Fall, 2008.
- Presentation: "Bioinformatics and Cotton Genetics" at Wayland Baptist University, Plainview, TX, November 30, 2007
- Presentation: "DVDs and Toilet Paper." Panhandle Area Mathematics and Science Conference, West Texas A&M University, Canyon, TX, September 2005.
- Presentation: "On the parallel implementation of the three-field finite element method for coupled parabolic systems." The Joint DCABES and ICPACE meeting on distributed algorithms for science and engineering, University of Greenwich, London, UK, August 25 – 27, 2005.
- Presentation: "A grid implementation for domain decomposition in solving stochastic partial differential equations." CE2005: The 12th ISPE International Conference on Concurrent Engineering: Research and Applications, Ft. Worth, TX, July 25 – 27, 2005
- Invited Presentation: "A three-field finite element method for elliptic partial differential equations driven by stochastic loads." Special Session on Theory and Application of Stochastic Differential Equations, AMS Sectional Meeting, Lubbock, TX, April 8 – 10, 2005
- Presentation: "On an implementation of a three-field finite element method for parabolic PDEs." Graduate Student Research Day, Texas Tech University, Lubbock TX, March 29, 2005
- Presentation: "A three field finite element method for stochastic PDEs." Applied Mathematics and Bio-mathematics Seminar, Texas Tech University, Lubbock, TX, March 1, 2005.
- Presentation: "Highway Slope Design." Panhandle Area Mathematics and Science Conference, West Texas A&M University, Canyon, TX, September 2004.
- Presentation: "A computational methodology to study coupled physical processes over partitioned domains." CCCT 2004: International Conference on Computing, Communications, and Control Technologies, Austin, TX, August 14-17, 2004.
- Presentation: "Real-Time Contaminant Dispersal Modeling with ContamW 2.0 and EON Studio." SC2003, Phoenix, AZ, November 18, 2003.
- Workshop: "Minimizing Mathematical Effort with Maple." Wayland Baptist University, Plainview, TX, Fall 2002
- Workshop: "Sorting Techniques and Queuing Theory." Panhandle Area Mathematics and Science Conference, West Texas A&M University, Canyon, TX, September 2001

- Presentation: “A (very brief) Introduction to Maple.” Professional Development, Wayland Baptist University, Plainview, TX, August 2001.
- Workshop: “Parametric Approximation of Data using Orthogonal Distance Regression Splines.” Applied Mathematics Seminar, Texas Tech University, Lubbock, TX, Spring 2001.
- Presentation: “Introduction to Graph Theory.” Panhandle Area Mathematics and Science Conference, West Texas A&M University, Canyon, TX, September 2000
- Presentation: “An Introduction to OpenMP.” Parallel Computing Seminar, Department of Mathematics and Statistics, Texas Tech University, Lubbock, TX, Spring 2000.
- Workshop: “Using Visual Studio for C and C++ Projects.” High Performance Computing Center, Texas Tech University, Lubbock, TX, 1999.