Jonathan C. Sevy

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Software and Systems Engineering Experience

- 16 years experience as software and system engineer and architect
- Participated in all phases of software development, including requirements, architecture and API specification, software design and coding, and test design and development
- Experienced in systems engineering process and methodology, including concept of operations, functional specification and system architecture
- Emphasis on embedded and network software and systems, including embedded Linux, multimedia, and wireless LAN and cellular systems

Mathematics and Education Experience

- 16 years experience as college mathematics and computer science instructor and department chair
- Taught wide range of undergraduate and graduate mathematics and computer science courses for majors and non-majors
- Performed mathematics and computing research with results published in peer-reviewed academic journals

Lutherie and Woodworking Experience

- Over 35 years experience designing and building acoustic and electric guitars
- Developed and published software tools and web resources to aid in guitar design and construction

Writing and Publishing Experience

- Published research papers in peer-reviewed academic journals
- Published articles related to guitar construction in peer-reviewed lutherie journals, as well as online guides for building steel-string acoustic guitars
- Authored online articles on finance and retirement planning
- Authored architecture specifications, user guides and customer briefs for network and embedded systems

Projects and Roles

Software and System Engineering

- Embedded Software and Systems
    - Android Platform Lead Software Architect
        - Software architect and project lead for Android platform port to multicore cellular telephony handset SoCs
        - Responsible for project strategy, architecture, planning, staffing, mentoring, coordination, oversight and reporting
    - Senior software developer in Platform Integration Group for 2G/3G mobile handset platforms
        - Developed device drivers and framework software for proprietary RTOS-based protocol stack and applications framework for
        - Provided architectural and design guidance and code review for software developed by junior team members
        - Provided system-level analysis and support for customer technical issues
    - Technical lead for embedded Linux port to ARM-based multicore cellular communications processor
        - Developed Linux port and board-support packages for ARM926EJ-based application processor in multicore baseband processor on cellular telephony development boards and handset
        - Created kernel adaptations, development system and drivers including ALSA driver for DSP audio interface and custom serial telephony stack interface
        - Ported Qtopia Phone Edition as graphical user interface environment
        - Managed contractors developing additional device drivers and framework components
    - Member of System Engineering team developing system requirements, analysis and software architecture for GSM/GPRS-based mobile telephony platforms
        - Developed and documented software architectures for subsystems of multicore protocol stack and applications framework
    - Software architect for embedded software development for dual-core ARM/DSP-based SoC for portable music player
        - Developed API, architecture and design for configurable audio processing engine utilizing ARM and DSP for multimedia processing
        - Provided technical oversight for code development by offshore subcontractor
    - Technical lead for embedded Linux software development for ARM-based mobile cellular communications products
        - Software lead for wireless bridge/router terminal device; developed software architecture, Linux port for custom board, and networking application code for hardware platform based on Intel XScale processor with custom ASIC, USB and Ethernet controller

        - Provided Linux port and driver development for IP telephony handset utilizing Intel XScale processor
    - Ported NetBSD operating system to custom ARM926EJ-S-based SoC
        - Developed kernel adaptations, serial driver, timer and interrupt handler
        - Documented process in article incorporated as part of NetBSD project documentation
    - Technical lead in development of platform-independent 802.11 MAC software
        - Responsible for architecture, design, coding and documentation of core MAC protocol state machine
    - Member of team developing platforms and products for toy industry
        - Developed software architecture based on PEG graphics library and Nucleus Plus RTOS for handheld voice-activated personal organizer
- Networking
    - Authored Java SNMP package for network device management software development
    - Used SNMP package to implement configuration and monitoring software for wireless LAN access points and SNMP Inquisitor query utility
- Design Automation
    - Designed and implemented web-based tools for VHDL and Verilog testbench generation utilizing forms-based server-resident and signed applet approaches
- Java Libraries
    - Created open-source Java and Android libraries to facilitate generation of various output formats using standard Java and Android graphics code
    - JDXF: Java DXF Library
    - JSVG: Java SVG Library
    - JODG: Java ODG Library
    - ADXF: Android DXF Library
    - GnuAPDF: Android PDF Library

Lutherie

- Acoustic and electric guitar construction
    - Constructed approximately 70 acoustic and electric instruments over a 45-year period
- Software utilities for graphical and structural design
    - Rosette Designer application (web, Java (PC) and Android) to help with the design of mosaic soundhole rosettes.
    - Guitar Design application (Java(PC) and Android) to help with the design of guitar body shapes.
    - Fretmarker Design Java (PC) application to help with the design of fretmarker inlays.
- Articles on topics in lutherie
    - Building a Steel-String Acoustic Guitar, a pictorial voyage through the construction of a guitar

- CNC Inlays in Lutherie, a tutorial on the use of inexpensive CNC routers to create inlays for lutherie
- Chainsaw Lutherie, a personal account of sourcing wood for lutherie straight from the log.
- Arched Workboards, a short piece on constructing and using arched workboards for flat-top guitar construction
- The Long Compass, a description of making and using this tool for drawing arcs of circles of large radii
- Calculating Arc Parameters, a short article on computing rises and radii of arcs. American Lutherie **58** (1999), 42-45.
- What Happens if I Make It Bigger? Estimation in the Workshop, an article on rules-of-thumb for how changes in dimensions of structural members affect stiffness and strength. American Lutherie **73** (2003), 36-39.
- Neck and Bridge Geometry for Domed Guitar Tops, an article on computing neck angles and bridge rises when using domed guitar tops. American Lutherie **81** (2005), p. 36-39.

Finance and Retirement

- Simulation and Analysis
  - Created multiple spreadsheet-based simulation packages to study the effect of retirement withdrawal schemes under historical and simulated scenarios
- Writing
  - Authored multiple articles discussing results obtained from simulation and analysis
    - *Life Tables and Retirement Planning*, 2015
    - *Retirement Withdrawal Strategies: Guyton-Klinger as a Happy Medium*, *2015*
    - *Perfect Knowledge in Retirement Planning: Efficiency, Deficiency, and Disruptiveness*, 2015
    - *Annual or Monthly Withdrawal? Dollar Cost Averaging in Retirement*, 2016
    - *Over-valued, Under-valued, or Just About Right? Assessing Retirement Portfolios in Current Conditions*, 2018
    - Retirement Withdrawal Efficiency Revisited: Variable Lifespan and Annuities, 2022
    - *Variable Withdrawal Schemes: Guyton-Klinger, Dynamic Spending, and CAPE-Based*, 2022
    - Health Care Funding in the US, 2016 (updated 2024)

Software Development Languages and Tools

- Java (Android and PC AWT)
- Javascript (including Bootstrap and Knockout libraries)
- C, C++ (including STL)
- ARM, MIPS, PowerPC assembly language
- GNU gcc development environment (native and cross)
- Eclipse Java and C/C++ development environments
- Android Studio
- ARM ADS and RVCT development suites
- Lauterbach Trace32, JTAGJet and EPI Majic embedded debug systems

Employment History

2016 – present
Retired
Easton, PA

- Continuing research and investigation into topics in finance, software development, and lutherie
- Documenting findings in online guides and articles

2010 - 2016
Android Software Architect, Concept Engineering
Intel Mobile Communications, Allentown, PA

- Responsible for strategy, software architecture and project leadership for Android platform development for cellular communication SoCs.

2008 - 2010
Principal Engineer, Embedded Software and Systems Engineering
Lutron Electronics, Coopersburg, PA

- Provided system analysis, modeling, functional specification and architecture for embedded software and systems for lighting control; provided guidance and mentoring for junior staff members.

2003 - 2008
Senior Staff Engineer, Embedded Software and Systems Engineering
Infineon Technologies / LSI Corporation / Agere Systems, Allentown, PA

- Responsible for system analysis, API, architecture, design, coding and testing of embedded software for multimedia and cellular communication SoCs, as well as mentoring and oversight of junior team members.

2002 - 2003
Embedded Software Engineer
Flarion Technologies, Bedminster, NJ

- Member of mobile products embedded software team; responsible for architecture, coding, testing, and deployment of software for wireless communication products including demonstration 3G handset and portable wireless to Ethernet bridge.

2000 - 2002
Principal Software Engineer
Intrinsix, Inc., Bethlehem, PA

- Involved in all phases of embedded software and EDA tool design and construction, including requirements definition, architecture, software construction, testing, and maintenance.

1999 - 2000
Associate Director (1999 - 2000), **Geometric and Intelligent Computing Laboratory**
Mathematics and Computer Science Department
Drexel University, Philadelphia, PA

- Performed research into ad-hoc wireless networking and provided general direction of computing laboratory employing approximately 15 graduate and undergraduate Computer Science students.
- Responsibilities included project supervision and equipment, software, and network planning, design, purchase and maintenance.

1991 - 2000
Department Chair (1995-2000)
Associate Professor (1997-2000)
Assistant Professor (1991-1997)
Department of Mathematics and Computer Science
DeSales University, Center Valley, PA

- Full-time faculty member and department chair in mathematics and computer science department offering undergraduate and masters degrees. Responsible for administration of academic department, including planning, budgeting, staffing, scheduling, and program and course development.
- Instructor for undergraduate and graduate courses in mathematics and computer science, including Computer Architecture, Discrete Mathematics, Calculus I - IV, Advanced Calculus, Linear Algebra, Differential Equations, Probability and Statistics, Operations Research, Numerical Analysis
- Research and publication in Mathematics and Computer Science (listed below)
- Service on Computer Advisory Committee, Department Chairs Committee, Board Budget and Finance Committee, Enrollment Services Committee

Education

M.S. Computer Science, 2000
Drexel University, Philadelphia, PA

- *Coursework:* Computer Networks, Compiler Construction, Operating Systems, Theory of Algorithms, Software Design, Machine Organization, Database Theory, Graphical User Interfaces, Parallel Programming, Artificial Intelligence

Ph.D. Mathematics, 1991
Drexel University, Philadelphia, PA

- *Thesis:* Acceleration of Convergence of Sequences of Simultaneous Approximants
- *Research Focus:* Applied mathematics, numerical analysis, approximation theory

B.S. Physics, 1981
Duke University, Durham, NC

- *Honors:* Phi Beta Kappa, Julia Dale Memorial Award in Mathematics

Continuing Education

- Software Architecture: Principles and Practices, Software Engineering Institute, Carnegie Mellon University, Pittsburgh, PA, 2006
- Systems Thinking, on-site training, E. Hole, Stevens Institute of Technology, 2009
- System Architecture, on-site training, P. Koopman, Carnegie Mellon University, 2009

Publications

Computer Science

- J. Sevy, *Porting NetBSD to a New ARM SoC*, February 2007, http://www.netbsd.org/Documentation/kernel/porting_netbsd_arm_soc.html
- J. Sevy, V. Zaychik, T. Hewett, W. Regli, *Evaluating Collaborative Design Studios*, proceedings of WETICE2000: Workshop on Enabling Technologies In Collaborative Engineering, June 2000.
- D. McWherter, J. Sevy, W. Regli, *Building an IP Network Quality-of-Service Testbed*, IEEE Internet Computing, August 2000.

Mathematics

- J. Sevy, *Acceleration of convergence of sequences of multivariate simultaneous approximants*, Calcolo **34** (1997), 51-69.
- J. Sevy, *Lagrange and least-square polynomials as limits of linear combinations of iterates of Bernstein and Durrmeyer polynomials* , Journal of Approximation Theory **80** (1995), 267-271.
- J. Sevy, *Convergence of iterated Boolean sums of simultaneous approximants*, Calcolo **30** (1993), 41-68.

Stringed Instrument Design and Construction

- J. Sevy, *Calculating Arc Parameters*, American Lutherie **58** (1999), 42-45.
- J. Sevy, *What Happens if I Make It Bigger? Estimation in the Workshop*, American Lutherie **73** (2003), 36-39.
- M. Doolin, *Calculating Guitar Side Height,* American Lutherie **75** (2003), p. 39; provided derivation of arched back deflection.
- J. Sevy, *Neck and Bridge Geometry for Domed Guitar Tops*, American Lutherie **81** (2005), p. 36-39.
- J. Sevy, *Getting Good Inlay Results with Inexpensive CNC Routers*, American Lutherie **144** (2021), p. 52.
- J. Sevy, *Quick-and-Dirty Magnetic Thickness Gauge*, American Lutherie **149** (2023), p.58
- J. Sevy, *A Simplified Larrivée-Style Binding Jig*, American Lutherie **152** (2024), p. 60.