Bill Seely

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PROFESSIONAL EXPERIENCE

Seely Consulting LLC **Jan. 2025 – Present**
Principal Consultant / Fractional CTO *Greenville, SC*

- Providing interdisciplinary systems architecture and engineering consulting services for complex hardware-software challenges, bridging software, electrical, mechanical, and controls engineering to deliver pragmatic, expert-level designs that ensure long-term stability and scalability.

Bright Wolf, a Cognizant Company **Apr. 2021 – Jan. 2025**
Principal Engineer *Greenville, SC*

- Developing and deploying IIoT solutions for industrial clients, focused on back-end development, hardware integration, operating systems, DevOps, communications protocols, and cybersecurity.
- Architected a mission-critical tolling system migration from a legacy SaaS model to a custom, self-hosted backend, securing full data sovereignty and eliminating vendor lock-in.
- Rearchitected a supply chain company's data platform and core algorithms, enabling enterprise-level scalability from tens of localized sites to hundreds of global sites.
- Debugged complex issues within integrated systems by leveraging a broad knowledge of electrical and software engineering, ranging from embedded electronics to high-level frameworks.

GE Renewable Energy **May 2019 – Apr. 2021**
Principal Software Architect *Greenville, SC*

- Designed a new software architecture for GE's realtime embedded software system, focusing on increased clarity and testability while reducing side effects and unwanted interactions.
- Brought software development principles and practices to a newly created software team by writing standards, leading training sessions, and mentoring developers and technical leaders.
- Created a unit testing framework, instituted code reviews, and set up DevOps infrastructure to improve scalability of the software product.

Senior Wind Control Systems & Operability Engineer

- Delivered $40 million value through development of a new thrust control algorithm for GE's next generation wind turbine platform.
- Created software for loads simulations and certification; wrote automation scripts and tuning procedures to enable requisition engineers to maximize the value from a complex algorithm.

GE Gas Power **Feb. 2006 – May 2019**
Senior Software & Control Systems Engineer *Greenville, SC*

- Designed, modified, and installed digital solutions and advanced controls to analyze, optimize, and control the next generation of power plants using GE's state-of-the-art Predix platform.
- Designed an improved overspeed algorithm which allowed the rotor to be redesigned with less expensive materials, leading to an unprecedented cost savings for every gas turbine sold.
- Improved market competitiveness of GE controls software by creating a new modular application software architecture, allowing the controls team to improve the speed and quality of customer software.
- Designed, programmed, and deployed multiple solutions in GE's Operations Optimization and Asset Performance Management suite, including Virtual Battery, Startup Optimizer, and Efficiency Optimizer.
- Improved quality and quantity of invention disclosures while serving on the patent evaluation board by lending my expertise on the patent filing and writing process to peers.
- Instructed peers and early career engineers, formally and informally, in group and individual sessions on a wide variety of topics, including practical and theoretical controls, data analysis, programming concepts and

languages, and power plant fundamentals.

Lead Controls Engineer *Greenville, SC*

- Designed, modified, and installed advanced controls for heavy duty gas turbine power plant systems, including combustion turbine, steam turbine, and heat recovery steam generator sub-systems. Worked on full scope of projects from concept to field validation.
- Created multiple GE OpFlex software solutions including OpFlex Attemperator Control, and OpFlex Fast Start.
- Designed model-based controls software for multiple heavy duty gas turbine engines in the GE fleet, including the 9FA.05, 9HA, and 7HA designs.
- Developed and led execution of test plan for model-based controls on the 9HA and 7HA gas turbines at GE's full-speed full-load test stand.
- Instructed early career engineers in four different lectures each year on the topic of analysis and design of control systems.
- Served on the patent evaluation board and as an expert contact for the intellectual property landscape committee.

Carolina Motion Controls **Jul. 2004 – Feb. 2006**

Controls Engineer *Greenville, SC*

- Designed and managed automation projects from concept to startup ranging from single-axis servo press and verification systems to multi-axis high-speed pick and place applications
- Designed systems to conform to safety regulations, requiring analysis of failure modes and consideration of controller observability to allow for detection and handling of faults
- Met with customers to define requirements for future projects and to support past projects
- Provided technical support to sales engineers during quoting process

PATENTS & PUBLICATIONS

Patents

- Seely, W., et al., Systems and Methods for Automatic Feedback Control in a Distributed Control System, U.S. Patent 11,502,904, issued Nov. 15, 2022.
- Seely, W., et al., Systems and Methods for Controlling and Monitoring Power Assets, U.S. Patent 11,107,169, issued Aug. 31, 2021.
- Seely, W., et al., Systems and Methods for Health Monitoring and Upgrade of a Distributed Controller, U.S. Patent 11,050,651, issued Jun. 29, 2021.
- Seely, W., et al., System and Method for Augmented Reality Overlay, U.S. Patent 10,885,689, issued May 1, 2021.
- Seely, W., et al., Gas Turbine Blade Flutter Monitoring and Control System, U.S. Patent 10,954,812, issued Mar. 23, 2021.
- Seely, W., et al., Systems and Methods for Controlling Drum Levels Using Flow, U.S. Patent 10,954,824, issued Mar. 23, 2021.
- Seely, W., et al., Methods and Systems for Determining Causes of Conditions in Components of Rotary Machines, U.S. Patent 10,852,217, issued Dec. 1, 2020.
- Seely, W., et al., System and Method for Identifying a Condition of Rotary Machine Components, U.S. Patent 10,713,773, issued Jul. 14, 2020.
- Seely, W., et al., Systems and Methods for Controlling Machinery Stress via Temperature Trajectory, U.S. Patent 10,677,102, issued Jun. 9, 2020.
- Seely, W., et al., Multi-Level Controller Systems and Methods for Controlling a Physical Asset, U.S. Patent 10,630,106, issued Apr. 21, 2020.
- Seely, W., et al., Distributed Finite State Machine Configuration for Controlling a Physical Asset, U.S. Patent 10,620,599, issued Apr. 14, 2020.
- Seely, W., et al., Power Generation System Control Through Adaptive Learning, U.S. Patent 10,474,113, issued Nov. 12, 2019.
- Seely, W., et al., Asset Degradation Model Baselining System and Method, U.S. Patent 10,358,983, issued Jul. 23,

2019.
- Seely, W., et al., System and Method for Preventing an Emergency Over-Speed Condition in a Rotating Machine, U.S. Patent 10,233,771, issued Mar. 19, 2019.
- Seely, W., et al., Fuel Supply System for Use in a Gas Turbine Engine and Method of Controlling an Overspeed Event Therein, U.S. Patent 10,100,747, issued Oct. 16, 2018.
- Seely, W., et al., Combined Cycle Power Plant System and Related Control Systems and Program Products (Continuation), U.S. Patent 9,964,002, issued May 8, 2018.
- Seely, W., et al., Adaptive Model-Based Method to Quantify Degradation of a Power Generation System, U.S. Patent 9,896,960, issued Feb. 20, 2018.
- Seely, W., et al., Combined Cycle Power Plant System and Related Control Systems and Program Products, U.S. Patent 9,863,286, issued Jan. 9, 2018.
- Seely, W., et al., System and Method for Controlling and Diagnosing a Combined Cycle Power Plant, U.S. Patent 9,547,294, issued Jan. 17, 2017.
- Seely, W., et al., Systems and Methods for Generating Variable Ramp Rates for Turbomachinery, U.S. Patent 9,500,136, issued Nov. 22, 2016.
- Seely, W., System and Method to Performance Tune a System, U.S. Patent 9,298,173, issued Mar. 29, 2016.
- Seely, W., et al., Single Loop Attemperation Control, U.S. Patent 8,733,104, issued May 27, 2014.
- Seely, W., et al., Method for Starting a Turbomachine, U.S. Patent 8,555,653, issued Oct. 15, 2013.
- Seely, W., et al., System and Method for Water Injection in a Turbine Engine, U.S. Patent 8,381,529, issued Feb. 26, 2013.
- Seely, W., et al., Method for Compensating for Combustion Efficiency in a Fuel Control System, U.S. Patent 8,276,363, issued Oct. 2, 2012.
- Seely, W., et al., System and Method for Measuring a Level of a Liquid in a Container, U.S. Patent 8,229,687, issued Jul. 24, 2012.
- Seely, W., et al., Method and System for Detection of Gas Turbine Combustion Blowouts Utilizing Fuel Normalized Power Response, U.S. Patent 7,997,083, issued Aug. 16, 2011.
- Seely, W., et al., Method for Detecting Onset of Uncontrolled Fuel in a Gas Turbine Combustor, U.S. Patent 7,950,238, issued May 31, 2011.

Publications
- Seely, W., Development of a Power System and Analysis of Inertial System Calibration for a Small Autonomous Underwater Vehicle, M.S. Thesis, Virginia Tech, 2004.

EDUCATION

Virginia Tech **Jul. 2004**
M.S., Electrical Engineering *Blacksburg, VA*
- Select Courses: Digital Signal Processing, Stochastic Processes and Random Variables, Linear Control Theory, Nonlinear Control, Multivariable Control, Real Analysis, Matrix Theory
- Graduate Research Assistant, 2003-2004
  Automation and Systems Control Laboratory
  - Researched automatic calibration methods for an inertial measurement unit, applied the research to the test vessel, and validated the research during live tests.
  - Directed PCB layout and assembly processes for final power system fabrication.
- Graduate Teaching Assistant, 2002-2003
  Bradley Department of Electrical and Computer Engineering
  - Graded homework, exams, and projects for an undergraduate Linear Control Systems course.
  - Evaluated student work on classical control topics including stability analysis, root locus, Bode plots, and PID controller design.

Rochester Institute of Technology **May 2002**
B.S., Computer Engineering *Rochester, NY*

- Select Courses: Digital System Design, Software Engineering, Image Processing, Computer Organization/Architecture, Linear/Digital Control Systems, Assembly Programming, Electronics, Operating Systems
- Early Career & Co-op Experience, 1998–2002
  ABB • Carrier • Parker Hannifin • JCS • RIT Real-Time Systems Lab
  - Embedded software, PLC systems, real-time operating systems, and industrial controls across manufacturing, HVAC, power, and automation domains.
  - Early exposure to cross-disciplinary engineering, fielded systems, and safety-critical software.
- Lab Teaching Assistant 2001-2002
  Department of Computer Engineering
  - Managed and instructed a laboratory section of 20 students, bridging the gap between theoretical control stability and physical hardware implementation
  - Assumed primary instructional responsibilities for the lab curriculum, leading lectures and technical demonstrations to ensure student comprehension of classical control theory

SKILLS & INTERESTS

- **Software Engineering:**
  - **High-Level:** Java, C#, C++, Python, Perl, LISP/Scheme
  - **Embedded:** C, Assembly, Rust
  - **Web:** Javascript/Typescript, HTML, CSS, PHP
  - **Cloud/IoT:** AWS, Azure, Google Cloud, AWS IoT, Azure IoT Hub, GE Predix & EdgeOS
- **Data & DevOps:**
  - **Database:** PostgreSQL, MySQL, MSSQL, SQLite
  - **CI/CD & Automation:** Jenkins, Ansible, Github, Gitlab
  - **Orchestration & Virtualization:** Kubernetes, RedHat Openshift, Proxmox, VMWare
  - **Cybersecurity:** SonarQube, Veracode, Prisma Cloud
- **Electro-Mechanical Design:**
  - **Mechanical:** AutoCAD, Solidworks, Fusion360
  - **Electrical:** PSpice, KiCAD, VHDL
  - **Control & Simulation:** Matlab/Simulink, MSC Easy5
  - **PCB Layout & Assembly:** KiCAD, Cadence EDA
- **Controls Engineering:**
  - **PLC:** IEC 61131; Industrial Controls: GE Mark VIe, Siemens, Emerson
  - **Algorithms:** Kalman Filter/EKF/UKF, LQR/LQG, PID, State-Feedback, MRAC, MPC
- **Computer Engineering:**
  - **Operating Systems:** Linux, Windows, MacOS, Unix
  - **Communication Protocols:** MQTT, OPC/UA, HTTPS, Ethernet/IP
- **Personal Projects**
  - **Interests:** Piano, Guitar, Homebrewing, Woodworking, Reading, Gaming, Electronics, Programming
  - **Projects:** Arcade cabinet, PID-controlled RIMS for brewing, Portable party photo booth, 3D Printer build and modifications, Automated financial analysis tools, Custom teardrop camper, Ham radio shack.