

## Summary

MS in Computer Science and BS in Physics with 20 years of industry experience in software engineering. Most recently, principal software engineer and architect for the TruTouch non-invasive alcohol monitor which was selected by *TIME magazine* for its *Best Inventions of 2006* issue. Expertise in the design and implementation of custom embedded Linux systems, device drivers, networked applications, software lifecycle, software testing, simulations, algorithms, V&V, and code optimization. Proficiency in building back-end support for product development including Linux development servers, scientific computing clusters, intranet services, configuration-control tools, and developing systematic processes and solutions at all levels and development stages.

## Experience

### TruTouch Technologies, Inc.

Director of Software Development, 2005-present

Served as the Director of Software Development bringing the world's first truly non-invasive alcohol monitor -- which uses near-infrared spectroscopy to interrogate tissue and determine alcohol concentration -- to market in 2007, with follow-on products in 2008 and 2013.

Responsible for the architecture, development, and lifecycle of the embedded system (Linux/C/RTAI/Bash) and associated networked applications (C#/MATLAB/Sockets) for three generations of commercial TruTouch products including the TruTouch 1100, 1250, and 2500, as well as upcoming generations of instrumentation in R&D phases. Designed a custom embedded system to support a wide range of uses in, among others, commercial products, laboratory experiments, clinical studies, and special, targeted-use scenarios.

Developed the infrastructure and processes that governed all software development and releases. Implemented all mathematical algorithms, state logic and data flow, Linux hardware drivers, high-level logic & QC, and autonomous health self-assessment. Core improvements to the mathematical algorithms and flow resulted in an order of magnitude efficiency improvement over previous software generations, greatly simplifying the hardware and electronics. Developed embedded and network tools that automated manufacturing processes, instrumental QC, data management, and system maintenance. Developed PC applications that interfaced with, and managed instruments.

Designed and implemented an efficient hybrid Linux/Windows Domain and intranet (AD/Kerberos/LAMP/Samba/DFS/...), tying together all facets of the business from product development through marketing and sales.

### VeraLight, Inc.

Research Scientist & Scientific Programmer, 2011-2012

Developed a software infrastructure (MATLAB/Bash/MySQL/Perl/Apache) for running massively parallelized minimization and optimization problems over several hundred computing nodes, which served as the backbone for research and development. Worked to optimize, standardize, and create user friendly front-ends to the computing resource. Designed, and implemented the back-end server that managed the system and associated terabytes of data. Efforts resulted in vastly increased throughput of jobs, allowing the team to meet strategic corporate goals in tight time frames.

### InLight Solutions, Inc.

Research Scientist & Scientific Programmer, 2000-2005

Designed and built a software infrastructure (MATLAB) to rapidly transition ongoing multidisciplinary scientific research and ideas into practical applications running on, or interfacing with, prototype medical instrumentation. Output included optimized, low-level mathematical algorithms and tools through high-level, visualization applications. This effort allowed the technical team to be agile and responsive in a high-paced environment. Software infrastructure was designed for reuse and rapid automated verification.

### Boeing-SVS, Inc. / SVS, Inc.

Systems Engineer, Controls & Simulation Group, 1996-2000

Developed end-to-end, physics-based simulations for the world's largest and most complex laser missile defense systems including the Airborne Laser (ABL), Space Based Laser (SBL), and Tactical High Energy Laser (THEL). Assumed the lead role in developing the software architecture necessary to build simulations of the complexity mandated by these programs. The success of these simulations led to new contracts and an expanded group, and a suite of simulation technologies rigorously tested and validated over a half decade and used in all of Boeing's directed energy programs.

## Education

### Degrees

- M.S. Computer Science (2017)
  - University of New Mexico
  - 4.07 (MS-CS hours - 32 hours)
  - 3.97 (ALL graduate hours - 48 hours)
  - 4.04 (ALL undergraduate hours - 45 hours)
- B.S. Physics & Computer Science (1995)
  - Gettysburg College
  - Summa Cum Laude
  - Honors in Physics
  - Honors in Computer Science
  - Minor Mathematics
  - 3.87 (ALL undergraduate hours - 108 hours)
  - 5th in class (top 1% of 454)

### Awards/Honors

- Graduated summa cum laude (1995)
- Dean's List (1991-1995)
- Miller Senior Prize in Physics (1995)
- Julius Eno Physics Prize (1993)
- Freshman Miller Prize in Physics (1992)
- Malcolm R. Dougherty Mathematical Award (1992)
- Phi Beta Kappa (1995-present)
- Alpha Lambda Delta-National Academic Honor Society (1991-1995)

## Professional Skills

**Programming:** Linux, Embedded Real-Time Linux, C/C++, C#, MATLAB, PERL, BASH, and other languages/platforms less often used. Embedded System Design & Development, Networked Applications (Sockets), Software Lifecycle, Open Source Compliance, Large-Scale Simulations.

**IT Administration:** Linux/Windows domain, DNS, WINS, DHCP, IPMI, DFS, AD, LDAP, PAM, Kerberos, Samba, Apache, Exchange, Subversion, Corporate Firewalls/VPN, Intranet design & development.

## Publications

1. T. Ridder, E. Hull, B. Ver Steeg, **B. Laaksonen**, "Comparison of spectroscopically measured finger and forearm tissue ethanol concentration to blood and breath ethanol measurements," *Journal of Journal of Biomedical Optics*, 16(2), (2011).
2. T. Ridder, B. Ver Steeg, **B. Laaksonen**, "Comparison of spectroscopically measured tissue alcohol concentration to blood and breath alcohol measurements," *Journal of Journal of Biomedical Optics*, 14(5), (2009).
3. A. Krishnamurthi, D. Terndrup, M. Pinsonneault, K. Sellgren, J. Stauffer, R. Schild, D. Backman, K. Beisser, D. Dahari, A. Dasgupta, J. Hagelgans, M. Seeds, R. Anand, **B. Laaksonen**, L. Marschall, T. Ramseyer, "New Rotation Periods in the Pleiades: Interpreting Activity Indicators," *The Astrophysical Journal*, 493, pp. 914-925, (1998).
4. S. Allain, J. Bouvier, C. Prosser, L. Marschall, **B. Laaksonen**, "Rotational periods and starspot activity of young solar-type dwarfs in the open cluster IC4665," *Astronomy and Astrophysics*, 305, pp. 498-506, (1996).
5. G. Burks, P. Clark, **B. Laaksonen**, "Astronomy in Cyberspace, an Experiment: the Online Journal of Astronomy Education," American Astronomical Society Meeting, 187, #05.01, (1995).
6. M. Richmond, R. Treffers, A. Filippenko, S. van Dyk, Y. Paik, C. Peng, L. Marschall, **B. Laaksonen**, B. Macintosh, I. McLean, "UBVRI Photometry of the Type Ia SN 1994D in NGC 4526," *The Astrophysical Journal*, 109(5), pp. 2121-33, (1995).
7. C. Prosser, M. Shetrone, A. Dasgupta, D. Backman, **B. Laaksonen**, S. Baker, L. Marschall, B. Whitney, K. Kuijken, J. Stauffer, "Rotation Periods of Open-Cluster Stars. III.," *Publications of the Astronomical Society of the Pacific*, 107(709), pp. 211-18, (1995).
8. **B. Laaksonen**, W. Romanishin, L. Marschall, "BVRI Photometry of supernovae 1993G, 1994D, 1994I, 1994M, 1994S, and 1994Q," American Astronomical Society Meeting, 185, #79.13, (1995).
9. C. Prosser, M. Shetrone, E. Marilli, S. Catalano, S. Williams, D. Backman, **B. Laaksonen**, V. Adige, L. Marschall, J. Stauffer, "Rotation Periods of Open-Cluster Stars. II.," *Publications of the Astronomical Society of the Pacific*, 105(694), pp. 1407-14, (1993).

## Intellectual Property

1. Trent Ridder, Ben Ver Steeg, Mike Mills, **Bentley Laaksonen**, Bill Kardeen, "Methods and Apparatuses for Improved Breath Alcohol Testing," U.S. Patent Application 13/008,000.
2. Trent Ridder, Ben Ver Steeg, Mike Mills, **Bentley Laaksonen**, "System for Noninvasive Determination of Alcohol in Tissue," WO/2010/085716, PCT/US2010/021898.
3. Trent Ridder, Ben Ver Steeg, James McNally, John Maynard, Russell Abbink, Mike Mills, **Bentley Laaksonen**, "System for Noninvasive Determination of Analytes in Tissue," U.S. Patent Application 2010-0010325.