GREG SMETHELLS

Software Architect | Python Expert | PACS/DICOM Specialist

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PROFESSIONAL SUMMARY

Software architect and Python expert with 25 years of experience designing and developing high-performance, distributed systems. Deep expertise in PACS/DICOM systems, medical device software (FDA-approved, ISO 62304 compliant), and modern DevSecOps practices. Proven track record architecting complex software solutions from the ground up, including an FDA-approved orthopedic PACS system serving over 25% of US orthopedic practices. Published researcher in computational physics and computer science with experience in high-performance computing on Department of Energy supercomputers. Proficient with modern AI development tools including Claude Code and Cursor.

TECHNICAL SKILLS

Programming Languages: Python (Expert), Java, JavaScript, HTML, CSS, Gherkin, C, C++

Software Architecture: Distributed Systems, Client-Server Architecture, High-Performance Computing, Software Design Patterns, Microservices

Medical Technology: PACS, DICOM and HL7 Standards, DCMTK, FDA Medical Device Software (ISO 62304, ISO 14971, IEC 81001-5-1), HIPAA Compliance (including HITECH).

DevOps & Cloud: GitLab, Slack, CI/CD, DevSecOps, APM (AppOptics, Datadog), Logging (Papertrail, Datadog), Google Cloud Platform (including Object Storage, Cloud Volumes, IAM)

Systems & Tools: Linux (Expert), MariaDB, Nginx, RabbitMQ, supervisord, gunicorn, celery, Docker, Kubernetes, git, k9s, skaffold, make, zsh, bash, and all manner of cmd-line utilities.

Cybersecurity: Public key cryptography, x509, SSL/TLS, System hardening (Linux, sshd, nginx), SAST (bandit, semgrep), DAST (OWASP Zap), CVE monitoring (Safety CLI, Spotbugs).

AI Development Tools: Claude Code (Subagents, Skills, Commands), Cursor, Gemini

PROFESSIONAL EXPERIENCE

Medstrat Technology Director

Zimmer Biomet | *November 2023 – Present* | *Downers Grove, Illinois*

- Directed three technology groups managing one of the largest orthopedic PACS installations in the United States: oversaw software engineering, quality testing, and system administration
- Built a patient portal to enable patient to upload, download, view, and share their own medical images with orthopedic practices
- Maintained and enhanced FDA-approved medical device software serving over 25% of US orthopedic practices with $16M+ ARR
- Ensured continued compliance with medical device regulations (ISO 62304, ISO 14971, IEC 81001-5-1) and HIPAA requirements
- Led technical integration efforts following Medstrat acquisition by Zimmer Biomet including the Design History File remediation to ISO standards compliance and the technical preparation of a 510(k) submission.

Chief Technology Officer

Medstrat, Inc. | *February 2006 – November 2023* | *Downers Grove, Illinois*

- Architected and led complete redesign of company's PACS system using modern client-server architecture and software design patterns, dramatically improving stability, performance, and maintainability
- Designed and developed FDA-approved Picture Archive and Communication System (PACS) for orthopedic medical imaging, radiology dictation, and pre-operative planning of surgical cases for joint replacement
- Built and scaled system to provide over 4 petabytes of HIPAA-compliant medical image storage across distributed infrastructure accessible in clinic and in the operating room
- Developed industry-first DICOM-enabled, Internet-accessible backup system providing automated redundancy for all active customers
- Implemented comprehensive DevOps practices including GitLab CI/CD pipelines, automated testing, and infrastructure-as-code
- Led migration of entire infrastructure to Google Cloud Platform (GCP) while maintaining 99.9%+ uptime for production medical systems
- Redesigned DICOM viewer using object-oriented design principles, improving performance and enabling new features for surgical planning
- Performed hands-on Python development while providing technical leadership, including R&D, technical writing, and cybersecurity oversight

Computer Scientist / Project Leader

Lawrence Livermore National Laboratory | *June 2002 – September 2005* | *Livermore, California*

- Developed PACT, a high-performance I/O toolkit for physics simulations running on massively parallel Department of Energy supercomputers
- Created first autoconf/automake build system capable of compiling portable C library across all UNIX platforms (HP-UX, Solaris, Linux, AIX, IRIX) with optional pthread or MPI support
- Implemented HDF5 I/O support enabling applications to abstract data file format output (PDB vs HDF5)
- Developed Python language bindings for PACT, enabling Python applications to perform I/O on scientific data formats
- Promoted to Project Leader after two years in recognition of technical contributions and leadership capabilities

Teaching Assistant

University of Wisconsin-Madison, Computer Sciences Department | *August 2000 – May 2002*

- Taught CS 354 Computer Organization & Programming, covering computer architecture, MIPS assembly language (SPIM), binary arithmetic, and low-level programming fundamentals

Research Assistant

University of Wisconsin-Eau Claire, Chemistry Department | *June 1997 – August 2001*

- Conducted computational chemistry research implementing convergence accelerators (Levin-u transform, Wynn rho algorithm) in quadruple-precision FORTRAN77 to compute three-electron atomic integrals with greater than 20 digits of precision

EDUCATION

M.S., Computer Sciences | University of Wisconsin-Madison | 2000 – 2002

B.S., Physics and Mathematics | University of Wisconsin-Eau Claire | 1994 – 1999

PUBLICATIONS

- Paul J. Pelzl, Gregory J. Smethells, and Frederick W. King, "Improvements on the application of convergence accelerators for the evaluation of some three-electron atomic integrals," *Physical Review E*, vol. 65, no. 3, art. 036707, 2002. https://doi.org/10.1103/PhysRevE.65.036707
- Frederick W. King, Gregory J. Smethells, Geir T. Helleloid, and Paul J. Pelzl, "Numerical evaluation of Hilbert transforms for oscillatory functions: a convergence accelerator approach," *Computer Physics Communications*, vol. 145, no. 2, pp. 256–266, 2002. https://doi.org/10.1016/S0010-4655(02)00155-8