

**Richard F. Hilliard II**  
rh@wn.net  
r.hilliard@computer.org  
+1 978 857 5036

## Employment

### **Software Systems Architect** (May 2001 – present)

- Providing software architecture services for the Army's Future Combat System, including stakeholder and concern analyses, architectural viewpoint definition, architectural view modeling, modeling and analysis to address non-functional concerns (such as quality of service, performance, and security), advice on applying ANSI/IEEE Std 1471. Member of FCS Horizontal Software Integration Team.
- Advised Cambridge Systematics (CS) on next-generation software architecture approaches and technology options for their product Pontis (transportation asset management system). Worked with CS on software process definition. Developed XML ontologies for asset management decision analysis.
- Developed the software strategy and Software Management Plan for NASA's Advanced Spectroscopic and Coronagraphic Explorer (ASCE) mission.
- Developed software applications to manage, analyze, and present student results on standardized assessments using Java and XML, as a part of the CELT Corporation's LearningSynergy product line.
- Software engineering and software management for NASA's Solar-B (named *Hinode* after launch) X-Ray Telescope (XRT). Co-authored the XRT's Software Management Plan, assisted in its implementation, and produced the XRT Flight Subsystem Software Requirements Specification. Providing continuing maintenance of the XRT software requirements baseline.
- Business process definition and software engineering methodology to clients including Cambridge Publications, Inc., Riverton Corporation, and Netegrity, Inc.

### **Chief Technical Officer**, CONSENTCACHE, INCORPORATED (July 2000 – July 2001)

- As a co-founder of an unfunded startup, devised technical approach to privacy management, architected initial service offering and led prototype development to deliver initial capability using XML and Java.

### **Director of Architecture**, ephibian (formerly, INTEGRATED SYSTEMS AND INTERNET SOLUTIONS, INC.) (June 1998 – July 2000)

- Director of architectural consulting services.
- Chief architect for the InternetEngine product line development.
- Co-creator of the Product Line Engineering Process for ephibian.

### **Lead Architect**, THE MITRE CORPORATION (August 1994 – May 1998)

- Founding member of the Chief Architects' Office of the Air Force's Electronic Systems Center. Developed architecture-based acquisition strategy for Air Force Command and Control (C2) systems. Conducted architectural reviews of Air Force C2 programs
- Contributor to Air Force's *Command and Control System Target Architecture*, a reference architecture for Air Force C2 acquisitions.

- Principal investigator for the *Architecture Description Framework* research project into architecture representation and tools.
- Lead developer and team leader of MITRE's *Architecture Quality Assessment*, adopted by the Air Force for enterprise-wide use.
- Co-inventor MITRE's practical architecture method.
- Contributor to the Army's Sustaining Base Information Services architecture.
- Architect for the Army Reserve Component Automation System Validation Team.
- Contributor to CORBA IDL/Ada 95 Mapping, Object Management Group, May 1995.

**Principal Engineer**, INTERMETRICS, INC. (January 1991 – July 1994)

- Member of the Ada 9X Mapping/Revision Team, for the design and development of the Ada 95 ISO standard.
- Member of AdaMagic software development environment product team.
- Developer of Intermetrics' Ada 9X/ANDF compilation system.
- Developer of Ada 95 object-oriented bindings to X Window System (Xlib and Xt layers).

**Lead Engineer**, THE MITRE CORPORATION (November 1982 – December 1990)

- Director, Ada Technology Specialty Group: Led research and technical advisory activities for Air Force Electronic Systems Division (ESD) programs using Ada, including: research into distributed software development environments; distributed simulation framework for Battle Management/C3 applications modeling; performance analysis of real-time embedded applications in Ada; consultant to numerous ESD programs on software engineering and Ada, acquisition strategy, trade studies and contractor assessments, source selection and procurements; led teams to prototype command and control, message handling, and management information systems.
- Project Leader, Automatic Programming Applications: developed knowledge-based system to generate Ada code from graphical, constraint-based specifications.
- Group Leader, Ada Acquisition Support: technical leader of team directing use of Ada on WWMCCS Information System. Ada tools prototyping and evaluation, definition of Ada design rules. Environment evaluation, specification and procurement. Use of military acquisition standards including DoD-Std-2167.
- Technical Staff, Software Technology Transfer: Ada transition planning for Air Force Electronic Systems Division. Contract monitoring: Training and Performance Support System.

**President**, N.I.L. GROUP (January 1980 – November 1982)

- Project Manager for CAI:OS, computer-aided instructional system for teaching nuclear power plant operations.
- Instructor and consultant in Structured Analysis. Systems analysis of aerospace manufacturing modernization programs for Boeing, Grumman, Northrop, Hughes, and Rockwell.

**Engineer**, HIGHER ORDER SOFTWARE (October 1978 – January 1980)

- Author and contributor to the development of the IDEF methods for Air Force's Integrated Computer-Aided Manufacturing (ICAM) Program.

- Co-designer of HOS Analyzer, prototype software development tool for HOS AXES methodology.
- Instructor and consultant in HOS AXES and other methods: SADT, PSL/PSA, SREM, HDM.
- Principal requirements analyst for ICAM Decision Support System.

**Instructor**, MASSACHUSETTS INSTITUTE OF TECHNOLOGY (September 1974 – June 1979)

- Instructor in MIT's Experimental Study Group. Developed and taught courses in computer science, artificial intelligence and linguistics.

## Recent Professional Activities

- Co-organizer (with Paul Clements, David Emery and Philippe Kruchten) of First Workshop on Aspects in Architectural Description, 12 March 2007 at AOSD 2007.
- Project editor of ISO/IEC 42010, *Software and Systems Engineering—Architectural Description*, IEEE liaison to ISO/IEC JTC1/SC7/ WG 42
- Reviewer, *IEEE Software*, 2005 to date.
- Referee, *Journal of Software Maintenance and Evolution*, 2004.
- Member, IFIP Working Group 2.10, Software Architecture, Feb 2005 to date. Invited participant since 2002.
- Referee, *IBM Journal of Systems and Software*, 2003.
- Visiting Scholar at Massachusetts Institute of Technology, May 2001 to date.
- Technical Editor of IEEE Working Group P1016 for the revision of ANSI/IEEE Standard 1016, *Recommended Practice for Software Design Descriptions*.
- Member, program committee for Second, Third and Fourth Workshops on Aspect-Oriented Modeling with UML, 2002–2003.
- Member, program committee for Methods and Techniques for Software Architecture Review and Assessment (SARA) Workshop at ICSE, May 2002.
- Co-organizer of the First Workshop on Architectural Viewpoints (2001) as a part of the 2nd Working IEEE/IFIP Conference on Software Architecture (WICSA).
- Respondant to Object Management Group's Request for Information for Unified Modeling Language 2.0, 1999.
- Invited member of the Software Architecture Review and Assessment (SARA) industry working group, sponsored by the Software Engineering Institute.
- Selected by IEEE Computer Society to develop the curriculum for *The Architecture of Software-Intensive Systems* as a part of the IEEE Software Engineering Competency Recognition Program.
- Panel chairman, for *Thinking outside the boxes and lines: practicing architects,* at the Software Engineering and Knowledge Engineering '98 meeting, June 1998, Monterey, California.
- Secretary of IEEE Architecture Working Group and technical editor of ANSI/IEEE Std 1471 (2000), *Recommended Practice for Architectural Description of Software-Intensive Systems*, 1995–2001.
- Signatory of *Computer Scientists' Amicus Brief to The Supreme Court of the United States*, October Term, 1995. In Lotus Development Corporation, Petitioner, v. Borland International, Inc., Respondent.

- Secretary of Ada/Motif Binding Working Group within IEEE POSIX (P1003.5), 1994–1995.
- Affiliate member of IEEE Computer Society.
- Organizer and Program Chair, “Informal Workshop on Object Oriented Programming in Ada,” September 1989, Woburn, Massachusetts.

## Selected Publications

- “Using Aspects in Architectural Description,” in *Proceedings of the 10th International Workshop on Early Aspects*, Lecture Notes in Computer Science 4765, Springer (to appear).
- “Architecture Description Languages in Practice – Session Report” with Eóin Woods. In *Proceedings of the 5th Working IEEE/IFIP Conference on Software Architecture (WICSA 2005)*.
- “ANSI/IEEE 1471 and Systems Engineering,” with M. Maier and D. Emery. In *Systems Engineering: the Journal of the International Council on Systems Engineering (INCOSE)*, 7(3), 2004.
- “Managing architectural concerns,” *Proceedings of the Conference on Integrated Design and Process Technology (IDPT-2002)*, Pasadena, USA, June 2002.
- “Don’t ask, don’t tell Inference,” *Proceedings of the ICSE’2001 Workshop on Living with Inconsistency*.
- “Viewpoint modeling,” *Proceedings of the ICSE’2001 Workshop on Describing Software Architectures with the UML*, May 2001.
- “Introducing IEEE 1471,” with M. Maier and D. Emery, *IEEE Computer*, April 2001.
- “IEEE 1471 and Beyond,” SEI Software Architecture Description Workshop, January 2001.
- “Views as modules,” *Proceedings of the Fourth International Software Architecture Workshop (ISAW-4)*, 4 and 5 June 2000, Limerick, Ireland.
- “Architectural Integration and Evolution in a Model World,” with A. Egyed, *Proceedings of the Fourth International Software Architecture Workshop (ISAW-4)*, 4 and 5 June 2000, Limerick, Ireland.
- “Using the Unified Modeling Language for Architectural Description,” In *«UML»’99 The Unified Modeling Language, Second International Conference*, Lecture Notes in Computer Science, volume 1723, Springer.
- “Patterns of Practical Architecting,” *OOPSLSA’99 Workshop on Patterns in Software Architecture*.
- “Aspects, Concerns, Views, ...,” *OOPSLA’99 Workshop on Multidimensional Separation of Concerns*.
- “Views and Viewpoints in Software Systems Architecture,” position paper for the First Working IFIP Conference on Software Architecture, February 1999, San Antonio, Texas.
- “Expressiveness in Architecture Description Languages,” with T. Rice, *Third International Workshop on Software Architecture*, November 1998, Orlando, Florida, ACM Press.
- “Representing software systems architectures or, components, connections, and (why not?) first-class constraints and views,” in *Joint Proceedings of the SIGSOFT’96 Workshops, 2nd International Workshop on the Architecture of Software Systems*, October 15–16, 1996, San Francisco.
- “Toward a recommended practice for architectural description,” with W. J. Ellis, P. T. Poon, D. Rayford, T. F. Saunders, B. Sherlund, and R. L. Wade. In *Proceedings of 2nd IEEE International Conference on Engineering of Complex Computer Systems*, Montreal, Quebec, Canada, October, 1996.
- “Experiences Applying a Practical Architectural Method,” with D. Emery, and T. Rice, In *Proceedings Reliable Software Technologies—Ada Europe’96*, Alfred Strohmeier (editor), Springer-Verlag, Lecture Notes in Computer Science, volume 1088.

- “The Architectural Metaphor as a Foundation for Systems Engineering,” with T. Rice and S. Schwarm. *Proceedings INCOSE '96 Symposium*, Boston, MA, July 1996.
- Co-author of ISO/IEC 8652:1995, *Information Technology – Programming Languages – Ada*.
- “Objects, Inheritance and Polymorphism in Ada 9X,” presented at TRI-Ada '91, San Jose, California.
- “Specifying Active Objects,” *OOPSLA'88 Workshop on Specification and Design for Object Oriented Programming*.
- “A Method of Behavior-Director Design,” with M. Gerhardt, *OOPSLA'87*.
- *Feasibility of Ada Code Generation with an Automatic Programming System*, MITRE Technical Report, 1987.
- *WIS Ada Design Language Standard*, with C. Byrnes, MITRE Technical Report, 1986.
- “Computer-assisted Simulation”, *DATA TRAINING*, 1(3), (1981).