# Scott Young Harmon

982 Dancer Road, Camas Valley, OR 97416
(541) 445-9100, harmon@zetetix.com


## SUMMARY OF CAPABILITIES

### Demonstrated Ability to Solve Challenging Problems through Technical Creativity and Scientific Discipline

- Acquired extensive knowledge and experience in information technology ranging from device physics through artificial intelligence; built skills in applying mathematical modeling tools from discrete mathematics, abstract algebra, statistics and calculus
- Originated and executed more than 71 research and development (R&D) projects including 6 evaluation process developments, 10 studies and literature surveys, 11 mathematical model formulations, 14 measurement and analysis projects, 18 complex system architecture designs, and 20 new technology concept developments; applied the results from these projects to 75 different implementations and demonstrations
- Designed, performed, analyzed and reported on experiments exploring autonomous system navigation and guidance, semi-autonomous forces behavior, satellite rotation, information system architectures, and source code quality
- Edited an international standard on distributed simulation verification, validation and accreditation (VV&A), contributed 19 articles to US DoD guidance on simulation VV&A, edited glossaries on simulation fidelity and simulation VV&A, and compiled extensive literature surveys on robotics, mobile robots, autonomous systems and verification and validation (V&V) of knowledge-based systems
- Organized and moderated 8 technical workshops on robotics research, mobile robotics, robot architectures and the science of simulation
- Authored and presented 109 technical publications on autonomous systems and robotics, complex system modeling and simulation, and software system quality measurement
- Provided technical expertise on software and simulation quality measurement, complex system modeling, and robotics and autonomous systems to 30 government and 14 industrial organizations

### Experienced Successful R&D Business Management

- Aggregated over 40 years experience in proposing, planning, executing and reporting on complex information systems R&D
- Formed and managed teams as large as 48 researchers in technical, project and line management roles
- Created advanced technology concepts and developed markets for them producing ~ $44M in R&D funding
- Founded and managed the NOSC Autonomous Systems Branch, Robot Intelligence International and Zetetix

## TECHNICAL ACCOMPLISHMENTS

Contributed to the 4 primary technology areas over the past 42 years

| Technical Area | Timeframe | Publications |
|---|---|---|
| Software system quality measurement | 1980-present | 28 |
| Complex system modeling & simulation | 1992-2002 | 27 |
| Robotics & autonomous systems | 1977-1996 | 48 |
| Solar energy | 1974-1977 | 6 |

### Robotics & Autonomous Systems

Developed techniques for sensing and situation awareness, planning and control, communications and coordination, and architectures; applied those techniques to an autonomous ground surveillance robot, a semi-autonomous laser welding system, a mars sample return rover and various military robotics projects; designed advanced architectures for 19 different information systems; conducted and published technical literature surveys on robotics, mobile robots, autonomous systems and European robotics research; organized and co-organized seven workshops on robotics, mobile robots and architectures for intelligent control; served as Mobility and Navigation Technical Editor, Journal of the Society of Robotics and Automation, 1984-1987

### Complex System Modeling & Simulation

Developed models of solar cell charge transport under high illumination, torpedo countermeasure threat trends, military command and control effectiveness, organization vulnerability to information warfare, computer generated forces quality, human behavior, information system behavior, military operations and distributed information system interoperability; developed techniques for dynamically composing distributed simulation executions; organized, moderated and documented a workshop that explored the science of simulation

### Software System Quality Evaluation

Developed and applied techniques for modeling and measuring the quality of models and simulation, information systems, intelligent systems, simulation validation processes, and software development processes; applied these techniques in 20 simulation and software development projects; formulated the SISO Fidelity Conceptual Model that rigorously describes simulation representational capabilities and the Validation Process Maturity Model that measures simulation validation process quality; contributed to the US DoD Modeling and Simulation Verification, Validation and Accreditation Recommended Practices Guide; served as technical editor for the SISO Fidelity Glossary and the IEEE Recommended Practice for Verification, Validation and Accreditation of a Federation (IEEE Std. 1516.4 - 2007)

### Solar Energy

Developed and applied a technique for measuring minority carrier lifetime in semiconductor devices under high illumination levels; developed and applied a technique to characterize the illumination flux produced by solar concentrators; contributed to testing solar cells designed for solar concentrators; compiled an exhaustive bibliography of photovoltaics that begins with the first report of the photovoltaic effect by Becquerel

## R&D BUSINESS ACCOMPLISHMENTS

Extensive experience in R&D business development and project management that includes founding a branch at a Government R&D organization and two private companies

### R&D Business Development Accomplishments

Developed and successfully marketed approximately $44M in R&D projects including advanced software and simulation verification and validation techniques, synthetic commander, intelligent welding workcell, autonomous mobile robot, analysis of fuel-fed automobile fires, intelligent synthetic forces, terrorist behavior simulation, source code quality measurement, hazardous road condition sensor, distributed computer intrusion detection, object-oriented system engineering techniques, information system interoperability analysis, physical security automation, and information physics for information assurance; founded and operated Robot Intelligence International, a robotics R&D business (4 years), and Zetetix, a software & simulation R&D business (16 years); founded and managed the Autonomous Systems Branch at the Naval Ocean Systems Center, San Diego (6 years)

### R&D Project Management Accomplishments

Managed R&D projects with staffing totaling more than 149 person-years; managed the Autonomous Systems Branch at the Naval Ocean Systems Center ($2.5M/yr, 15 professionals), San Diego; the Computational Intelligence Department ($4M/yr, 15 professionals); and the Information Sciences Laboratory ($12M/yr funding, 48 professionals) at the Hughes Research Laboratories

## EDUCATION

B.S., Physics, Arizona State University, 1974; M.S., Mechanical Engineering, Arizona State University, 1977; Thesis: Measurement of Minority Carrier Lifetime in Silicon Solar Cells under High Illumination

## EMPLOYMENT

| Position | Employer | Timeframe |
|---|---|---|
| Founder & Owner | Zetetix, Camas Valley, OR | 2016-Present |
| Chief Scientist | Innovative Management Concepts, Inc., Dulles, VA | 2013-2016 |
| Founder & Owner | Zetetix, Camas Valley, OR | 1997-2013 |
| Chief Scientist | Advanced Telecommunications, Inc., San Diego, CA | 1995-1997 |
| Laboratory Manager | Hughes Research Laboratories, Malibu, CA | 1994-1995 |
| Project & Department Manager | Hughes Research Laboratories, Malibu, CA | 1993-1994 |
| Project Manager | Hughes Research Laboratories, Malibu, CA | 1992-1993 |
| Sr. Member of the Technical Staff | Hughes Research Laboratories, Malibu, CA | 1990-1993 |
| Founder & Owner | Robot Intelligence International, San Diego, CA | 1986-1990 |
| Project & Branch Manager | Naval Ocean Systems Center, San Diego, CA | 1980-1986 |
| Electrical Engineer | Naval Ocean Systems Center, San Diego, CA | 1977-1980 |
| Research Assistant | Arizona State University, Tempe, AZ | 1974-1977 |

## PROGRAMMING LANGUAGES

Univac & PDP-11 assembly languages, PL/M, C, C++, Basic, FORTRAN, PL/SQL, Java, Ada, Lisp, OPS5, Rosie, HTML