# Curriculum Vitae **Edward J. Nava** Telephone: Work (505) 277-0809 ejnava@unm.edu

#### **Research Objectives:**

Development of innovative computer architectures and associated operating system software for highperformance systems, with robust information security capabilities. Target systems include conventional and cloud computing systems. A major teaching objective is to expand students' thinking to consider the consequences of system design approaches, instead of just focusing on performance.

#### **Qualifications:**

Over 39 years experience designing and/or evaluating systems used in applications where the consequences of failure is very high. This experience includes work at Sandia and Los Alamos National Laboratories, as well as 22 years of similar experience while serving as a Reserve Navy Engineering Duty Officer in parallel with the civilian career. Teaching experience includes teaching in the Electrical Engineering Department as a Senior Instructor at the US Naval Academy, experience teaching operating system fundamentals to Navy personnel at sea as one of the founders of the Afloat University, and as an adjunct professor at the University of New Mexico in the early 1980's. Extensive leadership experience as both a senior manager at Sandia National Labs and as a Commander, US Navy (Retired).

#### **Professional Experience:**

University of Nev	w Mexico		
Teaching Assistant - Instructor			2011 – 2015
Lecturer III			2015 - Present
Semester	Course No.	Course Title	Students
Spring 2016	CS 485	Intro Computer Networks	15
Spring 2016	ECE 331	Data Structures & Algorithms	26
Spring 2016	ECE 335	Integrated Software Systems	24
Spring 2016	ECE 440	Intro Computer Networks	25
Fall 2015	ECE 344L	Microprocessors	24
Fall 2015	ECE 344L	Microprocessors	14
Fall 2015	ECE 345	Intro to Control Systems	19
Fall 2015	ECE 345	Intro to Control Systems	7
Fall 2015	ECE 435	Software Engineering	48
Fall 2015	ME 380	Ana & Des Mch Con Sys	3
Fall 2015	ME 380	Ana & Des Mch Con Sys	38
Spring 2015	CS 485	Intro Computer Networks	5
Spring 2015	ECE 331	Data Structures & Algorithms	31
Spring 2015	ECE 335	Integrated Software Systems	18
Spring 2015	ECE 440	Intro Computer Networks	20
Fall 2014	ECE 435	Software Engineering	15
Spring 2014	CS 485	Intro Computer Networks	5
Spring 2014	ECE 331	Data Structures & Algorithms	26

Spring 2014	ECE 420	Senior Design II	40
Spring 2014	ECE 440	Intro Computer Networks	9
Fall 2013	ECE 419	Senior Design I	41
Fall 2013	ECE 435	Software Engineering	17
Spring 2013	CS 485	Intro Computer Networks	7
Spring 2013	ECE 331	Data Structures & Algorithms	27
Spring 2013	ECE 440	Intro Computer Networks	30
Spring 2012	ECE 330	Software Design	21
Spring 2012	ECE 330	Software Design	9
Fall 2011	CS 481	Computer Operating Systems	14
Fall 2011	ECE 437	Computer Operating Systems	15

# Research Assistant – Usage Management in Cloud Computing June 2012 – Nov 2012

Lead a team of students in developing a hierarchical approach to implementing usage management in cloud computing systems and also provided the administrative leadership necessary to meet the external sponsor reporting requirements.

# Sandia National Laboratories

Senior Manager, Information Systems and Analysis Center

- Led activities to analyze vulnerabilities of computer technologies used in high consequence applications.
- Led research activities focused on developing innovative ways to detect and react to attacks of computer systems for high consequence applications, considering all facets of system design.
- Formed a multi-organizational team to begin research activities focused on designing systems that are inherently secure; the research scope included trusted hardware design and manufacturing, computer architectures, operating systems, and application software implications. The team generated one Grand Challenge research proposal, and the team is currently pursuing other funding.
- Led the multi-center portion of the Sandia Laboratory Directed R&D research program associated with our program areas.
- Leader of a research group with seven technical departments and approximately 85 technical staff members.

# US Navy – Defense Threat Reduction Agency (Active Duty) 2003 – 2006

Stockpile Associate at Los Alamos National Laboratory (Detachment Officer in Charge)

- Led research activities focused on resolving anomalous issues on nuclear weapons.
- Developed a formal methodology for all similar weapon anomaly research efforts, resulting in recognition by DOE/NNSA, US Navy, and LANL leadership.
- Led a critical analysis effort on an innovative weapon design, resulting in an award from the Laboratory Director.

# US Navy – US Naval Academy (Active Duty)

Senior Instructor, Electrical Engineering Department

- Course coordinator responsible for developing curriculum and other materials for 12-14 sections per semester courses, teaching at least two sections per semester, and guiding all other instructors during the course of each class.
- Assistant Officer In Charge Command Seamanship Naval Training Squadron.

# 2001-2003

2006 - 2010

• Officer Representative – Latin American Studies Club.

### Sandia National Laboratories

Manager, Vulnerability Assessment Projects and Computer Science Department

- Led a six department team with 75 technical staff in the multi-disciplinary analysis of technologies used in systems for high consequence applications.
- Provided programmatic and technical guidance and technical for approximately 70 projects.

### US Navy Reserve (Reserve)

Executive Officer, SPAWAR Information Security Unit

- Developed opportunities for officers to support fleet Information Security evaluation activities, primarily on shipboard installations.
- Developed Information Technology training programs for active-duty fleet personnel, using reservists as trainers, and served as the first trainer on the Afloat University program.
- Completed Microsoft Certified System Engineer (Windows 2000) certification.
- Certified Navy Trainer & Certified Microsoft Trainer

# Sandia National Laboratories

Manager, Embedded Computers Department

- Led the development of a new generation of multi-processor flight computers in support of multiple flight programs. The development scope included all hardware, packaging, software development environment tools, operating systems, and flight test support.
- Initiated an enduring multi-million dollar processor development effort with the GPS program office that is still active in 2011.

# Sandia National Laboratories

Member of Technical Staff

- Led research efforts to apply digital signal processing methods to improve intrusion detection systems, yielding better discrimination than the existing analog threshold detection circuits.
- Led research efforts to apply real-time Kalman filtering to navigation systems for terrestrial vehicles; successfully demonstrated high precision navigation when combining rudimentary sensors with digital terrain elevation data.
- Led research effort to integrate digital maps with navigation systems for live displays in military vehicles.
- Led the development of new real-time navigation, guidance, and control systems using modern microprocessors and high-level programming languages for flight applications.

# Los Alamos National Laboratories

Technician

- Designed, built, tested, and installed digital control systems for the CO<sub>2</sub> laser mirrors used for the 10KJ laser fusion facility. Technologies included SSI, MSI, and LSI digital circuits and high power analog components in systems designed to operating in very high electrical noise environments.
- Provided training and ongoing support to the experimenters at the laser fusion facility.

#### 1994 - 2001

#### 1979 – 1987

1976-1979

1987 - 1994

# 1986 - 2008

University of New Mexico Ph.D. Engineering	2008 – 2015			
Research Focus: Design of computer architectures and system software to assure information securit while maintaining a high level of computational performance, with an emphasis on cloud computing. Dissertation: Usage Management Enforcement in Cloud Computing Virtual Machines.				
Stanford University M.S. Electrical Engineering Focus: Digital Control Systems and Digital Signal Processin	<b>1979 – 1980</b>			

University of New Mexico	1977 – 1979
B.S. Electrical and Computer Engineering	
With Distinction – Tied for #1 EECE Graduating Senior	
Focus: Digital system design, analog electronics, and microprocessors	
New Mexico State University	1970 – 1973

A.S. Electrical Engineering Technology Meritorious Graduate

### Awards:

Education:

Sandia National Laboratories, Individual Performance Award	2010
Sandia National Laboratories, Individual Performance Award	2009
Sandia National Laboratories, Individual Performance Award	2008
Sandia National Laboratories, Individual Performance Award	2007
Sandia National Laboratories, Individual Performance Award	2006
US Dept of Defense Meritorious Service Medal	2006
Los Alamos National Laboratories, Distinguished Performance Award	2005
US Navy Commendation Medal	2003
US Navy Meritorious Service Medal	2001
Sandia National Laboratories, Individual Performance Award	2001
Sandia National Laboratories, Individual Performance Award	2000
Sandia National Laboratories, Individual Performance Award	1997
US Navy and Marine Corps Achievement Medal	1997

#### **Unclassified Publications:**

"Usage Management Enforcement In Cloud Computing Virtual Machines", PhD Dissertation, 2015. "Policy-Based Security Provisioning and Performance Control in the Cloud", CLOSER 2013.

"The Sandia Airborne Computer (SANDAC)", Computing Systems in Engineering, Volume 3, Issues 1-4, 1992.

"A Land Navigation Demonstration Vehicle with a Color Map Display for Tactical Use", IEEE PLANS '86 Position Location and Navigation Symposium, Nov 1986.

"GPS Manpack Receiver Performance in a Commercial Utility Cargo Vehicle Installation", Sandia National Laboratories Technical Report, 1986.

"Odometer Damped Strapdown Inertial Navigation System Error Modeling", Sandia National Laboratories Technical Report, 1986.

"Performance Studies of Terrain-Aided Land Navigation Systems", Sandia National Laboratories SAND Report, 1985.

"A Terrain-Aided Land Navigation System", Sandia National Laboratories SAND report, 1983.

"Exterior Alarm Combination Techniques", Sandia National Laboratories Technical Report, 1982.

"Rocky Flats Plant Security Upgrade: Preliminary Buried Line Sensor Tests", Sandia National Laboratories Technical Report, 1982.

"Effects of Polarization and Surface Composition on Exterior Perimeter Microwave Sensors Preliminary Report", Sandia National Laboratories Technical Report, 1981.

### **Professional Memberships:**

Institute of Electrical and Electronics Engineers, member Association for Computing Machinery, member Association of the United States Navy, Past National Vice President, District President, Chapter President Reserve Officers Association, member, National Junior Officer of the year candidate Amateur Radio Relay League, General Class License, K5EJN Eta Kappa Nu Tau Beta Pi