

# Jean Gourd

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## Research Interests

Broad areas

- Cyber security
- Artificial intelligence
- Soft computing
- Distributed computing
- Software engineering

Focus

- Mobile code management and security
- Intelligent software agents for cyber security
- Open source software

Topics of interest

- Design principles for embedded tamper-resistant intelligent agents
- Adaptive virtual machines for defense against VM-aware cyber attacks
- Quasi-honeypots for defense against cyber attacks: mitigation, adaptation, and protection
- Genetically conceived intelligent agents for cyber security
- Mobile agents on mobile devices
- The role (and use) of open source software in cyber security
- FPGAs for use as co-processors and as confinement environments for malware
- Web services in support of mobile agent migration
- Proactive cyber security education
- Modeling multi-agent systems

## Education

*Ph.D., Computational Science* (Computer Science), 2007

University of Southern Mississippi, Hattiesburg, MS

Thesis: API-S Calculus: Formal Modeling for Secure Mobile Intelligent Agent Systems

GPA: 4.0/4.0

*B.S., Computer Science, 2004, Summa Cum Laude*  
University of Southern Mississippi, Hattiesburg, MS  
Thesis: Smart Server: Concepts and Applications  
GPA: 4.0/4.0

*A.A., Business Administration and Management, 1995*  
Santa Fe Community College, Gainesville, FL  
GPA: 3.71/4.0

## **Research Experience**

*Center for Secure Cyberspace (CSC):* A joint collaboration between Louisiana Tech University and Louisiana State University, “[t]he goal of the CSC is to establish a national center of excellence dedicated to education and research in integrated smart cyber-centric sensor surveillance systems.” Research primarily involves the use of intelligent agent technologies in support of cyber security. Additionally, ongoing research in tamper resistant design principles for embedded intelligent agents is being pursued.

*Computational Science Research Facility for Defense Data Integration (CSR-DDI):* As Senior Research Assistant, research primarily involved mobile intelligent agents in heterogeneous data gathering and data fusion. Supervised a team of research assistants in the design and development of a multi-agent reconfigurable fuzzy logic framework used to provide a fused input to an external inclusive decision support system; 2004–2008.

*Database Research Lab for Intelligent Agents (DRLIA):* As Research Assistant, research included soft computing and the use of intelligent mobile agents for heterogeneous data gathering and data fusion; 2004–2008.

Performed DoD-related work on intelligent agents for data integration; 2004–2008.

## **Teaching Experience**

*Assistant Professor*

- Cyber Security (CSC499), Louisiana Tech University
- Senior Capstone (CSC404), Louisiana Tech University
- Software Design and Engineering (CSC403), Louisiana Tech University
- Compiler Design (CSC436), Louisiana Tech University
- Programming Languages (CSC330), Louisiana Tech University
- Data Structures (CSC220), Louisiana Tech University
- Advanced Computer Architecture (CSC626/726), University of Southern Mississippi
- Embedded Microcomputer Design (CET420/420L), University of Southern Mississippi
- Theory of Programming Languages (CSC415/515), University of Southern Mississippi
- Computer Science II (CSC102), University of Southern Mississippi

- Object Oriented Programming (CSC317), University of Southern Mississippi

*Guest Lecturer*

- Advanced Distributed Database Systems (CSC633/733), University of Southern Mississippi, Fall 2005–2006
- Analytical Models for Computer Systems (CSC623), University of Southern Mississippi, Spring 2005
- Formal Methods in Programming Languages (CSC620), University of Southern Mississippi, Spring 2005–2007
- Introduction to Artificial Intelligence (CSC412/512), University of Southern Mississippi, Spring 2005–2007
- Theory of Programming Languages (CSC415/515), University of Southern Mississippi, Spring 2005

*Guest Speaker*

- *On Raising Awareness of and Addressing Cyber Security Issues*, Seminar in Computational Sciences, University of Southern Mississippi, April 2010
- *In Preparation for the Ostensible “Cyber Storm”*, Cyber Innovation Center Member Luncheon, March, 2010
- *API-S Calculus: Formal Modeling for Secure Mobile Intelligent Agent Systems*, Center for Secure Cyberspace, Louisiana Tech University, January 2009
- *Cyber Security: Is it Attainable?*, Seminar in Computational Sciences, University of Southern Mississippi, November, 2008
- *Mobile Intelligent Agents: A Primer*, Center for Secure Cyberspace, Louisiana Tech University, September 2008
- *Towards the Modeling and Analysis of the Security of Mobile Intelligent Agents*, Seminar in Computational Sciences, University of Southern Mississippi, February 2007
- *Intelligent Machines: On Motivating Soft Computing Concepts*, Seminar in Computational Sciences, University of Southern Mississippi, February 2007
- *Intelligent Machines: Magic or Trick?* The Mississippi Space Grant Consortium Teacher Conference, School of Computing, University of Southern Mississippi, January 2007

*Tutor*

- Computer Science and Mathematics (primarily Algebra, Trigonometry, and Calculus), University of Southern Mississippi, 2003–2005

**Work and Professional Experience**

Louisiana Tech University  
*Assistant Professor*

Ruston, LA  
 2008–present

As member of the Center for Secure Cyberspace (CSC), research relates to secure cyber defense, focusing on intelligent agents and soft computing techniques. Duties

include teaching numerous graduate and undergraduate classes, serving on various committees, and sustaining ongoing funding opportunities.

University of Southern Mississippi  
*Visiting Assistant Professor*

Hattiesburg, MS  
2007–2008

Duties include teaching 10 hours (3 classes)–including one graduate level class–serving on requested committees, contributing to the evaluation of the undergraduate and graduate curriculums, maintaining current and topical scholarly research, and sustaining ongoing funding opportunities.

University of Southern Mississippi  
*Research Assistant*

Hattiesburg, MS  
2004–2007

As Senior Research Assistant for the *Computational Science Research Facility for Defense Data Integration*, research primarily involved DoD-related work in the area of mobile intelligent agents in heterogeneous data gathering and data fusion. Duties included the supervision of a team of research assistants in the design and development of a multi-agent reconfigurable fuzzy logic framework used to provide a fused input to an external inclusive decision support system. Concurrently operated as research assistant for the *Database Research Lab for Intelligent Agents* in the area of soft computing and the use of intelligent mobile agents for heterogeneous data gathering and data fusion.

University of Southern Mississippi  
*Teaching Assistant*

Hattiesburg, MS  
2002–2004

Graded papers, exams, quizzes, and numerous other assignments for various courses (Computer Organization, Data Structures, Operating Systems, Programming Languages, Compilers, Object-Oriented Programming, Artificial Intelligence) in the Computer Science Department.

Nantahala Outdoor Center  
*River Guide*

Ocoee, TN  
2002

Guided groups of young people and families in whitewater rafts on the Ocoee and Nantahala Rivers in Tennessee and North Carolina, emphasizing the beauty of nature and the strength and ultimate results of cooperation, teamwork, and organization.

Flowers Baking Company  
*Sales Manager*

Baton Rouge, LA  
1997–2002

Managed and trained several groups of employees in the company's sales and marketing divisions. Organized and maintained the company's operation's division in numerous locations and their surrounding areas. Worked as company troubleshooter and considerably reduced employee turnover, increased overall morale by utilizing team-building techniques, and reorganized the company's distribution system to be more efficient and ultimately more profitable. Helped improve and maintain the company's proprietary computer system, including the unique handheld remote modules and main computer systems.

Self Employed

Gainesville, FL

*Computer Troubleshooting Specialist* 1992–1997  
Designed, built, and maintained computer networks for numerous firms. Determined and fixed an assortment of computer related problems.

## Mentoring Experience

Committees Chaired:

- M.S. Advisory Committee **Chair**: Justin Poole, *Visualizing Network Infrastructures to Provide Next Generation Real Time Defense*, Louisiana Tech University, 2009–2010.
- Ph.D. Advisory Committee **Chair**: Teri Williams, *Sub Pixel Analysis And Processing of Sensor Data for Mobile Target Intelligence Information and Verification*, Louisiana Tech University, 2008–2010.

Committees Attended:

- M.S. Advisory Committee: Umesh Dhital, Louisiana Tech University, 2009–2010.
- M.S. Advisory Committee: Zibo Wang, Louisiana Tech University, 2009–2010.
- Ph.D. Advisory Committee: Swadheen Songmen, Louisiana Tech University, 2009–2010.
- Ph.D. Advisory Committee: Khandaker Abir Rahman, Louisiana Tech University, 2009–2010.
- Ph.D. Advisory Committee: Md. Arafat Sultan, Louisiana Tech University, 2009–2010.
- Ph.D. Advisory Committee: Md. Shafaeat Hossain, Louisiana Tech University, 2009–2010.
- M.S. Advisory Committee: Kendyala Swetha, Louisiana Tech University, 2009–2010.
- Ph.D. Advisory Committee: Jeremy Kackley, *DNAgents: Genetically Engineered Intelligent Mobile Agents*, University of Southern Mississippi, 2008–2010.
- Ph.D. Advisory Committee: Shrijit S. Joshi, *Naïve Bayes and Similarity Based Methods for Identifying Computer Users Using Keystroke Patterns*, Louisiana Tech University, 2008.

Supervised Research:

- Justin Poole, *Cyber Security Research*, Louisiana Tech University, 2009.

## Proposals and Grants

“Genetically Engineered Tamper-Resistant Intelligent Agents,” March 2010, AFOSR, \$48,607; PI; *funded*.

“FPGA-Based Net Framework with Embedded Agents as Cyber Attack Detectors,” March 2010, AFOSR, \$64,030; PI; *funded*.

“LA Tech Proposal for the Cybersecurity Research Program at the Cyberspace Research Laboratory,” March 2010, AFOSR, \$1,189,458; Co-PI; *funded*.

“Exposing the Netprint,” March 2010, DARPA (Cyber Genome Program), \$1,565,738; Co-PI.

“Virtual Organization for Collaboration and Advancement of Learning Institutes (VOCAL),” February 2010, NSF (Cyber Enabled Discovery and Innovation), \$431,470; PI.

“Mobile Agent Framework for Intelligent Attack Response,” January 2010, US Army Research, Development, and Engineering Command, \$36,000; PI.

“CYEN: A Roadmap to Creating and Deploying Cyber Engineering at Louisiana Tech University,” January 2010, US Department of Homeland Security, \$69,484; PI.

“Identifying Vulnerabilities from Binary Executable Code Characteristics,” November 2009, Intelligence Advanced Research Projects Activity, \$904,712; PI.

“Contained Automated Software Environment,” November 2009, Intelligence Advanced Research Projects Activity, \$1,280,618; PI.

“Cyberspace Research Laboratory,” April 2009, Air Force Office of Scientific Research, \$2,840,000; Participated in proposal preparation; *funded*.

“DINER: Distributed Information Discovery Laboratory,” November 2008, Louisiana Board of Regents, \$50,156; Co-PI; *funded*.

“DECIDE: Decision Engine for Cyber Infrastructure of Distributed Agents,” September 2008, NSF, \$685,648; Co-PI.

“Data Conflation and Integration with Intelligent Agents Support,” 2005–2009, US Army/SMDC/JSU, \$140,000; Co-PI; *funded*.

“Applying Fuzzy Logic to the Modeling and Prediction of the Effect of Global Pollution on the Gulf Coast,” October 2006, JSU/MRC/NASA, \$264,924; Participated in proposal preparation.

“Geospatial Web Services Portal for Integration of GIS and Enhancement of Emergency Response,” June 2006, Homeland Security Dept., \$750,000; Participated in proposal preparation.

“Net-Centric Web Services Brokering System for Geospatial Information Discovery, Analysis and Reporting utilizing Intelligent Mobile Agents,” April 2006, NGA, \$449,926; Participated in proposal preparation.

“Rapid Prototyping Support and Operational Transition Assessment Utilizing a Grid Computing Environment,” October 2005, NASA Applied Sciences, \$773,044; Participated in proposal preparation.

## Service

Conferences:

- *Technical Program Committee Member/Reviewer*, International Conference on Contemporary Computing, Noida, India, 2009–present
- *Proceedings Editor*, 2<sup>nd</sup> Cyberspace Research Workshop (2009), Shreveport, LA, 2009
- *Publication and Proceedings Chair*, 2<sup>nd</sup> Cyberspace Research Workshop (2009), Shreveport, LA, 2009

- *Technical Program Committee Member/Reviewer*, 2<sup>nd</sup> Cyberspace Research Workshop (2009), Shreveport, LA, 2009
  - *Session Chair*, Decision Support Systems, International Conference on Industry, Engineering, and Management Systems, Cocoa Beach, FL, 2007–present
- Coach*, BearingPoint Intercollegiate Programming Competition, Hattiesburg, MS, 2008–present
- Chair*, Danny R. Carter Scholarship Committee, School of Computing, University of Southern Mississippi, 2008
- Chair*, Bob Cold Award Committee, School of Computing, University of Southern Mississippi, 2008
- Judge*, Sixth Innovative Design for Computing Competition, University of Southern Mississippi, 2008
- Event Supervisor*, Mississippi Science Olympiad, University of Southern Mississippi, 2008
- Graduate Council Representative*, School of Computing, College of Science and Technology, University of Southern Mississippi, 2006–2007
- High School Student Guide*, School of Computing, University of Southern Mississippi, 2003–2007
- Student Ambassador*, College of Science and Technology, University of Southern Mississippi, 2003–2005
- Judge*, Regional Science and Engineering Fair, University of Southern Mississippi, 2005
- Chair*, Student Focus Group, Computer Science Department, University of Southern Mississippi, 2004
- Technology Chair*, Golden Key International Society, University of Southern Mississippi, 2003–2004
- Deans Search Committee*, College of Science and Technology, University of Southern Mississippi, 2003
- Other:
- Participated in an effort to create computer software for young and disabled children to promote education in various subject areas, including Mathematics and Language Arts, Spanish River High School, 1989

## **Honors and Awards**

- National Dean's List, 2004–2007
- President's List, 2002–2007
- Danny R. Carter Scholarship, 2003–2005
- Key Club Scholarship, 1992
- Presidential Academic Fitness Award, 1992
- Harvard Alumni Association Prize Book, 1991

## Memberships

Institute of Electrical and Electronics Engineers (IEEE), 2007–present  
Association for Computing Machinery (ACM), 2006–present  
Golden Key International Honor Society, 2003–present  
International Magician’s Society (lifetime membership), 1990–present  
National Honor Society, 1991–1992  
National Beta Club, 1991

## Technical Skills

### Languages

- *Proficient:* C, C++, Java, C#, Visual Basic, HTML, PHP, SQL, JavaScript, L<sup>A</sup>T<sub>E</sub>X, bash, PIC/Atmel Assembly, PIC C
- *Familiar:* Ada, Pascal, ASP.NET, Perl, FORTRAN, Lisp, CLIPS, Smalltalk, awk, Verilog, VHDL, Viva, MPI, OpenMP, PBASIC, PICBASIC, QBasic, BASIC, 68000 Assembly

### Operating Systems

- Linux (current varieties of choice are Ubuntu and Fedora)
- Windows 95/98/NT/2000/XP, MS-DOS

### Applications

- Oracle, Apache, BIND, CVS, git, MySQL, SQL Server, MS Visual Studio .NET, OpenOffice, MS Office, vi, Maple

## Journal Publications

J. Gourd and D. Ali. A calculus for modeling security and mobility in multi-agent systems. *The Journal of Management and Engineering Integration*, 2010. Submitted.

J. Kackley and J. Gourd. A flow direction algorithm for geometry-based networks utilizing a prioritized bfs method. *The Journal of Management and Engineering Integration*, 1(1):115–119, 2008.

J. Kackley, M. Gambrell, and J. Gourd. I3P: A protocol for increasing reliability and responsiveness in massively multiplayer games. *Journal of Advanced Computational Intelligence and Intelligent Informatics*, 12(2):142–149, 2008.

J. Gourd, M. Cobb, P. Wahjudi, and D. Ali. Smart server: Concepts and applications. *International Journal of Intelligent Systems*, 22(10):1139–1154, 2007.

## Book Chapters

J. Gourd and G. Vert. Hyper distribution of contextual information—the consumer producer problem. In *Global Contextual Processing, Its Constraints and Theoretical Operation*, pages 165–259. Taylor and Francis. Currently under final review.

## Other Selected Refereed Publications

J. Gourd. Cyber Storm: The Culmination of an Undergraduate Course in Cyber Security. In *Worldcomp10: The 2010 World Congress in Computer Science, Computer Engineering, and Applied Computing*, Las Vegas, NV, July 2010.

J. Gourd and G. Vert. Hyper Distribution of Contextual Information: Solving the Unknown Producer-Unknown Consumer (UP-UC) Problem. In *Worldcomp'10: The 2010 World Congress in Computer Science, Computer Engineering, and Applied Computing*, Las Vegas, NV, July 2010.

J. Gourd and D. Ali. A Calculus for Modeling Security and Mobility in Multi-Agent Systems. In *Proceedings of the 2010 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL, March 2010.

J. Kackley, J. Gourd, and M. Gambrell. Increasing P2P Gameplay Performance Utilizing I3P. In *GameOn-NA'09: 5th International North American Conference on Intelligent Games and Simulation*, Atlanta, GA, August 2009.

G. Vert, J. Gourd, and S.S. Iyengar. Integration of the visual authentication of spatial data with spatial-temporal class taxonomies for advanced spatial authentication modeling to create pretty good security. In *Proceedings of the 2nd Cyberspace Research Workshop*, Shreveport, LA, June 2009.

J. Gourd. A web services based approach to mobile agent migration and security. In *Proceedings of the 2009 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Gourd and D. Ali. A weighted relative contribution algorithm for grid-based analysis of heterogeneous geospatial data. In *Proceedings of the 2008 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Kackley and J. Gourd. A flow direction algorithm for geometry-based networks utilizing a prioritized bfs method. In *Proceedings of the 2008 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Kackley, M. Gambrell, and J. Gourd. I3P: A protocol for increasing reliability and responsiveness in massively multiplayer games. In *International Symposium on Intelligence Techniques in Computer Games and Simulations*, Shiga, Japan, March 2007.

P. Wahjudi, J. Gourd, J. Kackley, and D. Ali. Applying fuzzy logic to the modeling and prediction of the effect of global pollution on the gulf coast. In *Proceedings of the 2007 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

D. Butler, P. Wahjudi, J. Gourd, and D. Ali. Multilevel computational teaching techniques utilizing the parallax boe-bot. In *Proceedings of the 2007 International*

*Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

G. Coburn, J. Gourd, and D. Ali. Multi-agent confidence framework for heterogeneous data fusion. In *Proceedings of the 2007 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Kackley, M. Johnson, K. Yang, P. Wahjudi, J. Gourd, and D. Ali. Nationally organized distributed database system for evacuation planning management. In *Proceedings of the 2007 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

I. Gang, D. Dobson, J. Gourd, and D. Ali. Parallel implementation and analysis of mandelbrot set construction. In *Proceedings of the 2007 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Kackley, G. Coburn, J. Gourd, and D. Ali. Parallel implementation of concurrently executing petri nets. In *Proceedings of the 2007 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Gourd, P. Wahjudi, and L. Guo. Development, testing, and simulation of a smart phone card prototype. In *Proceedings of the 2006 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Gourd, J. Stone, M. Bennett, and D. Ali. Examining contraflow in evacuating a major city. In *Proceedings of the 2006 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Gourd and C. Burgess. Development and analysis of the parallelization of a sequential integration-by-parts algorithm using petri nets. In *Proceedings of the 2006 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

J. Gourd, J. Heath, P. Wahjudi, D. Ali, and M. Cobb. Smart server: Integrating intelligence into a web server. In *Proceedings of the 2004 International Conference on Industry, Engineering, and Management Systems*, Cocoa Beach, FL.

## Miscellaneous

- *Citizenship*: United States of America
- *U.S. Government Clearance*: Secret (active)
- *Other spoken languages*: French
- *Personal Interests*: Tinkering with electronics, french pastry and artisan bread baking, homebrewing a variety of styles of beer (IPA being the current favorite), woodworking, performing magic tricks and illusions, reading novels and fascinating non-fiction (current favorite authors are Robert Ludlum and Richard Feynman), playing racquetball, occasionally playing the guitar, sampling wines from around the world with a focus on those from the Bordeaux, Burgundy and

Rhone regions of France, and indulging in the occasional cigar (current favorites include Montecristo and Ashton).

## References

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