Frank T. Ferrese, PhD, PE

CONTACT INFORMATION	FJT Technologies LLC 414 First Avenue Haddon Heights, NJ 08035	*Phone:* (856) 924-4690 *E-mail:* frank@fjttech.com *Web:* www.fjttech.com

EDUCATION

Villanova University, Villanova, PA USA

PhD, Engineering, May, 2013

Villanova University, Villanova, PA USA

M.S., Computer Engineering, May, 2006

Drexel University, Philadelphia, PA USA

B.S., Electrical Engineering, May, 1995

AREAS OF EXPERTISE

FORENSIC ELECTRICAL ENGINEERING

- Electrical fires
- Electrical shock and electrocution
- Appliances (dishwashers, heaters, boiler controls, refrigerators)
- Vehicle fires
- Residential electrical systems
- Commercial / Manufacturing Plant / Municipal Electrical Systems
- Lighting systems (incandescent, LED, high intensity discharge lamps, high pressure discharge lamps, low pressure discharge lamps)
- Emergency generators
- Communication systems

PATENT AND INTELLECTUAL PROPERTY CONSULTING

- Intellectual property / Patents involving electrical systems and circuits
- Support the preparation of Inter Partes Review and Petitions
- Preparation of declarations
- Prior art identification

CONSULTING

- Statistical Analysis
- Emergency Generator Sizing
- National Electrical Code Compliance
- Circuit Design
- System Design and Analysis

FJT Technologies LLC, Haddon Heights, NJ USA

President / Forensic and Consulting Electrical Engineer　　　　　　**2013 - Present**

Technical Responsibilities
- Electrical device and/or system failure analysis
- Power System failure analysis
- Cause and Origin of electrical fires
- Preparation of forensic engineering reports
- System requirements analysis
- Prior art searches
- Preparation of Inter Partes Reviews and Declarations
- Support for depositions
- Testify as an electrical engineering expert witness

Naval Surface Warfare Center, Philadelphia Division (NSWCPD), Philadelphia, PA USA

Lead Research Engineer for Advanced Control and Autonomy Systems **February, 2005 - Present**

Technical Responsibilities
- Develop optimal control methods for reactive power control
- Control system and communication system development for 1 Megawatt AC/DC generation, distribution and power conversion laboratory
- Shipboard power system and Microgrid modeling, analysis, and control system development
- Research and development of advanced methods of control for distributed electrical and fluid distribution systems
- Analysis, modeling and simulation of electrical power system components and systems
- Hardware in the loop simulation and experiment design for power systems
- Control system design for machinery systems on unmanned vehicles
- Communication system design
- Circuit design, power electronic controller design and development
- Power system stability analysis
- Founder and Director of the Controls, Autonomy, and Intelligent Systems Laboratory
- Provide subject matter expertise to organizations such as the Office of Naval Research (ONR) and Advanced Research Projects - Energy (ARPA-E), and Defense Advanced Research Agency (DARPA) in the areas of control theory, computational intelligence, dynamic system modeling, hybrid systems
- Design and construction of hardware in the loop controls experiments for verification and validation of advanced control methodologies
- Cyber security for military power and control systems

Lead Engineer for Navigation and Steering Control Systems　　　**March 2004 - September, 2005**

- Design, installation, and support of shipboard navigation and control systems
- Developed specifications for navigation, steering control, and propulsion control systems for various US Navy ship classes
- Developed verification and validation tests for shipboard industrial control systems
- Developed hardware and software systems for steering and navigation

Engineering Manager - Navigation and Steering Controls Section **November 2000 - March 2004**
Manager for a section of 17 engineers, technicians, and support personnel working on programs related to navigation and steering control systems

Lead Engineer LPD-17 Ship Control System **March 2000 - October 2000**
Lead engineer for LPD-17 class new construction Ship Control System (SCS) during the design, development and land based testing of the SCS

Computational Systems Incorporated, Essington, PA USA

Senior Consultant **April 1999 - March 2000**
Consultant to major firms such as Xerox and Owens Corning in the area of Reliability Centered Maintenance programs for large production facilities

Naval Surface Warfare Center, Carderock Division, Philadelphia, PA USA

Integrated Condition Assessment System Project Manager **November 1997 - March 1999**
Responsible for the technical direction of the Integrated Condition Assessment System program, which is a software based monitoring and analysis system for machinery equipment condition

Submarine Antenna Systems Project Engineer **March 1992 - October 1997**
Supported the design, installation, and life cycle support of submarine antenna systems

PUBLICATIONS

Books

Distributed Control of Heterogeneous Systems, Dr. Frank Ferrese, ISBN-10:3659237868, Lambert Academic Publishing, 2013

Journal and Conference Papers

1. **Synchrony in Networked Microgrids under Attacks** Abhinav, Shankar and Modares, Hamidreza and Lewis, Frank L and Ferrese, Frank and Davoudi, Ali (2017) IEEE Transactions on Smart Grid

2. **Optimization based AC Microgrid Synchronization** Abhinav, Shankar and Schizas, Ioannis D and Ferrese, Frank and Davoudi, Ali (2017) IEEE Transactions on Industrial Informatics

3. **Energy Saving in Microgrid with Tree Configurations using Nash Bargaining Solution** Ren, Q., Bai L., Biswas S., & Ferrese, F. (2016)Resilient Control Systems, IEEE Symposium on, 2016

4. **Online Optimal Generation Control Based on Constrained Distributed Gradient Algorithm** Zhang, W., Xu, Y., Liu, W., Liu, L., & Ferrese, F. (2015)Power Systems, IEEE Transactions on, Volume 30, Issue 1

5. **Distributed Subgradient-Based Coordination of Multiple Renewable Generators in a Microgrid** Zhang, W., Xu, Y., Liu, W., Ferrese, F., & Liu, L. (2014)Power Systems, IEEE Transactions on, Volume 29, Issue 1

6. **Distributed Fuzzy Logic Price Negotiation in Market Based Multi-Agent Control** Thibodeau, B., Qiangguo, R., Li Bai, Ferrese, F. Biswas, S., & Dong, Q. (2013) Resilient Control Systems, IEEE Symposium on, 2013

7. **Fully Distributed Coordination of Multiple DFIGs in a Microgrid for Load Sharing** Zhang, W., Xu, Y., Liu, W., Ferrese, F., & Liu, L. (2013) Smart Grid, IEEE Transactions on, Volume 4, Issue 2

8. **Market-based resource allocation for distributed data processing in wireless sensor networks** Zimmerman, Andrew T., Jerome P. Lynch, and Frank T. Ferrese ACM Transactions on Embedded Computing Systems (TECS) 12.3 (2013): 84.

9. **Multiagent-Based Reinforcement Learning for Optimal Reactive Power Dispatch** Xu, Y. and Zhang, W. and Liu, W. and Ferrese, F. Systems, Man, and Cybernetics, Part C: Applications and Reviews, IEEE Transactions on, Volume 42, Number 6, 2012

10. **Resilient consensus control for linear systems in a noisy environment** Biswas, S. and Ferrese, F. and Dong, Q. and Bai, L. American Control Conference (ACC), 2012

11. **Adaptive Neural replication and resilient control despite malicious attacks** Giorgi, S. and Saleheen, F. and Ferrese, F. and Won, C.H. IEEE Resilient Control Systems (ISRCS), 2012 5th International Symposium on 2012

12. **Multiagent-Based Reinforcement Learning for Optimal Reactive Power Dispatch** Xu, Y. and Zhang, W. and Liu, W. and Ferrese, F. Systems, Man, and Cybernetics, Part C: Applications and Reviews, IEEE Transactions on, Volume 42, Number 6, 2012

13. **Resiliency of linear system consensus in the presence of channel noise** Ferrese, F. and Biswas, S. and Dong, Q. and Bai, L. Resilient Control Systems (ISRCS), 2012 5th International Symposium on

14. **Cooperative Federated Control with Application to Tracking Control** Ferrese, F. and Dong, Q. and Bradshaw, K. and Chaves, S. and Biswas, S. and Bai, L. IEEE 13th International Conference on High Performance Computing and Communications (HPCC), 2011

15. **Cooperative Federated Multi-Agent Control of Large-Scale Systems** Dong, Q. and Bradshaw, K. and Ferrese, F. and Bai, L. and Biswas, S. Control and Applications, 2011

16. **Optimal Feedback Control of Power Systems Using Eigenstructure Assignment and Particle Swarm Optimization** Ferrese, F.; Dong, Q.; Biswas, S; Nataraj, C; Naval Engineering Journal, Volume 123 Number 1, 2011

17. **Design of a Reliable Distributed Secure Database System** Bai, L. and Biswas, S. and Ferrese, F. Networking, Architecture and Storage (NAS), 2010 IEEE Fifth International Conference on

18. **Market Based Computational Task Assignment with Autonomous Wireless Sensor Networks** Zimmerman, A; Lynch, J; Ferrese, F; Proceedings of IEEE 2009 International Conference on Electro/Information Technology

19. **Multi-Agent Based Interoperable Wireless Sensor Network Model** Xiong, Bai, Ferrese;
Proceedings of the 2009 IEEE Sensors Conference

20. **Performance Analysis of Mobile Agent Based Wireless Sensor Network** Bai, Ferrese, Ploskina, Biswas; 2009 8th International Conferecne on Reliability, Maintainability, and Safety

21. **A Control System Test Bed for Demonstration of Distributed Computational Intelligence Applied to Reconfiguring Heterogeneous Systems** Srivastava, S.K.; Cartes, D.A.; Maturana, F.; Ferrese, F.; Pekala, M.; Zink, M.; Meeker, R.; Systems Conference, 2007 1st Annual IEEE 9-13 April 2007 Page(s):1 - 8

22. **Survivability Analysis of Reconfigurable Systems** Bai, Li; Biswas, Saroj; Ortiz, Albert; Ferrese, Frank; Dalessandro, Don; Dong, Qing; Industrial Engineering and Engineering Management, 2007 IEEE International Conference on 2-4 Dec. 2007 Page(s):663 - 667

23. **Anti-Threat Mobile Agent Based Ship Freshwater Cooling System** Lu, Yan; Ferrese, Frank; Labouliere, Mike; ASNE Ship Control Symposium Conference Proceedings, 2007

24. **An Architecture for Shipboard Auxiliary System of Systems Simulation and Testing** Brown, Kevin; Ferrese, Frank; Zink, Mike; Longo, Don; ASNE Ship Control Symposium Conference Proceedings, 2007

25. **Recent Developments In U.S. Navy Navigation Systems** Ferrese, Frank; Naval Forces ISSN 0722-8880 VI 2002

26. **Implementation of Shipboard Data Into Maintenance Decisions** Ferrese, Frank; Savage, Chris; ASNE Intelligent Ships Symposium III Conference Proceedings 1999

ACADEMIC / TEACHING EXPERIENCE

Temple University - Graduate Adjunct Faculty
- Courses: Engineering Analysis, Electrical Circuits and Devices, Modern Control Theory, Digital Control Theory, Cryptography, Hardware Security, Software Security, Probability and Statistics, JAVA Programming, Optimization Theory

Drexel University - Adjunct Faculty
- Courses: Motor Controls

Villanova University- Adjunct Faculty (Online)
- Courses: Autonomous Control, Electric Motor Drives, Cryptography, Optimization for Engineers

Southern New Hampshire University- Adjunct Faculty
- Courses: Statistics, Calculus III, Linear Algebra

PhD Advisory Committee member for Dr. Sachi Jayasuriya, Drexel University 2017
- Thesis topic: Model-based and Data-driven Algorithms for Diagnostics of Nonlinear Dynamic Systems

PhD Advisory Committee member for Dr. Mohsan Samadani, Villanova University 2017
- Thesis topic: Model-based and Data-driven Algorithms for Diagnostics of Nonlinear Dynamic Systems

PhD Advisory Committee member for Dr. Chukwuemeka Aduba, Temple University 2014

- Thesis topic: N-Player Statistical Nash Game Control: M-th Cost Cumulant Optimization

PhD Advisory Committee member for Dr. Michael Balchanos, Georgia Institute of Tech- nology 2012

- Thesis topic: An intelligent, knowledge-based multiple criteria decision making advisor for systems design

PhD Advisory Committee member for Dr. Matthew Hoepfer, Georgia Institute of Technol- ogy 2012

- Thesis topic: Towards a comprehensive framework for co-simulation of dynamic models with an emphasis on time stepping

PhD Advisory Committee member for Dr. Qing Dong, Temple University 2011

- Thesis topic: Feedback Control of Anti-swing Overhead Crane

PhD Advisory Committee member for Mr. Kyungjin Moon, **Georgia Institute of Technology** 2010

- Thesis topic: Self-Reconfigurable Ship Fluid-Network Modeling for Simulation-Based Design

PhD Advisory Committee member for Ms. Daili Zhang, **Georgia Institute of Technology** 2008

- Thesis topic: Multi-Agent Based Control with Distributed Dynamic Inference Engine for Large-scale Complex Systems

PhD Advisory Committee member for Mr. Yongchang Lee, **Georgia Institute of Technology** 2007

- Thesis topic: An Intelligent, Knowledge Based Multiple Criteria Decision Making Advisor for Systems Design

PATENTS

1. Thermal Management Smart Valve with Rupture Detection and Isolation (US Patent No. US8600566B1)
2. Dynamic Simulation of a System of Interdependent Systems (US Patent No. US8589133B1)

INVITED TALKS

1. "An Introduction to the Use of Game Theory in Naval Engineering Applications " February 20, 2013, ASNE Day, Arlington, Va
2. "Distributed Control using Auction Theory and Optimal Control Theory", June 26, 2013, Siemens Corporate Research, Princeton, NJ
3. "The Ship as a Microgrid ", September 11, 2014, Government and DoD Smart Grids and Alternative Energy Symposium, Arlington, Va
4. "Cyber Security Primer ", May 21, 2015, ASNE Intelligent Ship Symposium, Philadelphia, Pa
5. "Cyber-Physical System Security, Cybersecurity in Action, Research, and Education (CARE-Con), April 2, 2016, Temple University, Philadelphia, Pa

HONORS AND AWARDS

- Meritorious Service Award, Villanova University College of Engineering, 2014
- Institute of Electrical and Electronics Engineers (IEEE) Young Engineer of the Year, Philadelphia Section, 2007

- Member of the external advisory panel for Idaho National Laboratory Distinctive Signature in Instrumentation, Controls, and Intelligent Systems
- Member of the IEEE technical committee for Resilience and Security for Industrial Applications (ReSia)
- Reviewer for numerous transactions and conferences including IEEE Transactions on Systems, Man, and Cybernetics, American Control Conference, and IEEE/ASME Transactions on Mechatronics
- Letter of Commendation from Chief of Naval Operations Code N7C, Navigator / Oceanographer of the Navy for contributions to safety of navigation and mission accomplishment, 2005
- Letter of Commendation from DDG 1000 Program Manager, PMS 500 for outstanding performance as Integrated Bridge System and Navigation Systems Lead, 2006
- The American Society of Naval Engineers President's Award, 2003
- Naval Surface Warfare Center Submarine Systems Department Junior Engineer of the Year, 1996
- Naval Surface Warfare Center, Carderock Division, Philadelphia Co-op Engineer of the Year, 1994

VOLUNTEER AND PRO BONO WORK

- Industrial Advisory Committee, Temple University Department of Computer Science, (2015 - Present)
- Advisory Panel Member - Idaho National Laboratory Distinctive Signature for Instrumentation, Controls, and Intelligent Systems (2009 - 2013)
- General Chair - IEEE International Symposium on Resilient Control Systems (2013, 2014, 2015, 2016)
- Member - Haddon Heights Planning Board (2013 - Present)
- Temple University Electrical Engineering Department Advisory Panel (2008 - 2010)
- Temple University Professional Science Master's Degree in Cyber Security Advisory Panel (2015 - Present)