

# Frank T. Ferrese, PhD, PE

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CONTACT INFORMATION FJT Technologies LLC *Phone:* (856) 924-4690  
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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
- Batteries related failures and fires
- 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

## EXAMPLE PROJECTS

- Design and construction oversight for an emergency generator system at a municipal building
- Forensic engineering and failure analysis of a lighting system at an intersection where a pedestrian was struck by a vehicle
- Forensic engineering and failure analysis for a solar panel installation where the failure to properly follow the National Electrical Code and proper installation methods resulted in a residential fire
- Hardware and software design for autonomous operation of electrical distribution, HVAC, chiller water distribution, propulsion, high pressure air distribution and steering for a fleet of unmanned ships for the U.S. Navy
- Testing and analysis of residential wiring systems that were subject to electrical surges as a result of shorts on electrical distribution lines
- Design of test fixtures and testing of pump control equipment for residential septic systems
- Failure analysis of lithium ion batteries as potential cause for fires (numerous cases)

## PROFESSIONAL EXPERIENCE

### **FJT Technologies LLC**, Haddon Heights, NJ USA

*President / Forensic and Consulting Electrical Engineer*  
Technical Responsibilities

**2013 - Present**

- 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 Conference 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

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