Publications

All papers in review are available upon request in their most recent, revised versions. Their corresponding round of review is also provided below. Students' last names are underlined. The below table provides symbols for the major focus of the publications.

Research Area	Dynamic Networks Theory	Water	Energy/Power	Transportation	GPS
Symbol					

PhD thesis

1. **Taha**, A. F. (2015). "Secure estimation, control and optimization of uncertain cyber-physical systems with applications to power networks". PhD thesis. Purdue University, Department of Electrical and Computer Engineering,  .

Patents

1. Dong, B., A. **Taha**, N. Gatsis, Z. Li, and A. Pipri. *Systems and Methods for Optimizing Buildings-to-Grid Integration*. U.S. Patent Application No. 62-516830, patent filed December 13, 2018,  .
2. Khalajmehrabadi, A., N. Gatsis, D. Akopian, and A. **Taha**. *Real-Time Detection and Mitigation of Time Synchronization Attacks on the Global Positioning System*. U.S. Patent Application No. 16-227744, patent filed December 20, 2018,  .
3. Wang, S., A. **Taha**, and J. Wang. *Energy Crowdsourcing and Peer-to-Peer Energy Trading in Blockchain Enabled Smart Grids*. U.S. Patent Application No. 62-769377., provisional patent filed November 19, 2018,  .

Journal articles

1. Fontenot, H., K. S. Ayyagari, B. Dong, N. Gatsis, and A. F. **Taha** (2021). Buildings-to-distribution-network integration for coordinated voltage regulation and building energy management via distributed resource flexibility. *Sustainable Cities and Society* **69**, 102832,  .
2. Haber, A., S. Nugroho, P. Torres, and A. F. **Taha** (2021). Control Node Selection Algorithm for Nonlinear Dynamic Networks. *IEEE Control Systems Letters* **5**(4), 1195–1200,  .
3. Liu, Y., A. K. Singh, J. Zhao, A. P. Meliopoulos, B. Pal, M. A. M. Ariff, T. V. Cutsem, M. Glavic, Z. Huang, I. Kamwa, L. Mili, S. Mir, A. F. **Taha**, V. Terzija, and S. Yu (2021). Dynamic State Estimation for Power System Control and Protection. *IEEE Transactions on Power Systems*. In press,  .
4. Nugroho, S. A. and A. F. **Taha** (2021). Towards Understanding Sensor and Control Nodes Selection in Nonlinear Dynamic Systems: Lyapunov Theory Meets Branch-and-Bound. *Automatica*. In press,  .

5. Nugroho, S. A., A. F. **Taha**, and C. Claudel (2021). A Control-Theoretic Approach for Scalable and Robust Traffic Density Estimation using Convex Optimization. *IEEE Transactions on Intelligent Transportation Systems* **22**(1), 64–78, .
6. Nugroho, S. A., A. F. **Taha**, and V. Hoang (2021). Nonlinear Dynamic Systems Parameterization Using Interval-Based Global Optimization: Computing Lipschitz Constants and Beyond. *IEEE Transactions on Automatic Control*. In press, .
7. Shadfan, R., S. Wang, S. A. Nugroho, F. Chen, and A. F. **Taha** (2021). Lipschitz Hydraulic Model for Water Distribution Networks. *Electronic Research Archive*. In press, .
8. **Taha**, A. F., S. Wang, Y. Guo, T. Summers, N. Gatsis, M. Giacomoni, and A. Abokifa (2021). Revisiting the Water Quality Sensor Placement Problem: Optimizing Network Observability and State Estimation Metrics. *Journal of Water Resources Planning and Management*. In press, .
9. Wang, S., A. F. **Taha**, and A. Abokifa (2021). How Effective is Model Predictive Control in Real-Time Water Quality Regulation? State-Space Modeling and Scalable Control. *Water Resources Research*. In press, .
10. Wang, S., A. F. **Taha**, L. Sela, N. Gatsis, and M. Giacomoni (2021). Probabilistic State Estimation in Water Distribution Networks. *IEEE Transactions on Control Systems Technology*. In press, .
11. Lee, J., A. F. **Taha**, N. Gatsis, and D. Akopian (2020). Tuning-Free, Low Memory Robust Estimator to Mitigate GPS Spoofing Attacks. *IEEE Control Systems Letters* **4**(1), 145–150, .
12. Nugroho, S. A., A. F. **Taha**, and J. Qi (2020). Robust Dynamic State Estimation of Synchronous Machines with Asymptotic State Estimation Error Performance Guarantees. *IEEE Transactions on Power Systems* **35**(3), 1923–1935, .
13. Risbud, P., N. Gatsis, and A. F. **Taha** (2020). Multi-Period Power System State Estimation with PMUs under GPS Spoofing Attacks. *Journal of Modern Power Systems and Clean Energy* **8**(4), 597–606, , .
14. Wang, S., A. F. **Taha**, N. Gatsis, and M. Giacomoni (2020). Receding Horizon Control for Drinking Water Networks: The Case for Geometric Programming. *IEEE Transactions on Control of Network Systems* **7**(3), 1151–1163, .
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17. Nugroho, S. A., A. F. **Taha**, N. Gatsis, T. H. Summers, and R. Krishnan (2019). Algorithms for joint sensor and control nodes selection in dynamic networks. *Automatica* **106**, 124–133, .
18. Risbud, P., N. Gatsis, and A. F. **Taha** (2019). Vulnerability Analysis of Smart Grids to GPS Spoofing. *IEEE Transactions on Smart Grid* **10**(4), 3535–3548, , .
19. **Taha**, A. F., M. Bazrafshan, S. Nugroho, N. Gatsis, and J. Qi (2019). Robust Control for Renewable-Integrated Power Networks Considering Input Bound Constraints and Worst-Case Uncertainty Measure. *IEEE Transactions on Control of Network Systems* **6**(3), 1210–1222, .

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23. Dong, B., Z. Li, A. **Taha**, and N. Gatsis (2018). Occupancy-based buildings-to-grid integration framework for smart and connected communities. *Applied Energy* **219**, 123–137, ϟ.
24. Khalajmehrabadi, A., N. Gatsis, D. Akopian, and A. F. **Taha** (2018). Real-Time Rejection and Mitigation of Time Synchronization Attacks on the Global Positioning System. *IEEE Transactions on Industrial Electronics* **65**(8), 6425–6435, ➤.
25. Qi, J., A. F. **Taha**, and J. Wang (2018). Comparing Kalman Filters and Observers for Power System Dynamic State Estimation with Model Uncertainty and Malicious Cyber Attacks. *IEEE Access* **6**, 77155–77168, ϟ.
26. **Taha**, A. F., J. Qi, J. Wang, and J. H. Panchal (2018). Risk Mitigation for Dynamic State Estimation Against Cyber Attacks and Unknown Inputs. *IEEE Transactions on Smart Grid* **9**(2), 886–899, ϟ.
27. Taormina, R., S. Galelli, N. O. Tippenhauer, E. Salomons, A. Ostfeld, D. G. Eliades, M. Aghashahi, R. Sundararajan, M. Pourahmadi, M. K. Banks, et al. (2018). Battle of the attack detection algorithms: Disclosing cyber attacks on water distribution networks. *Journal of Water Resources Planning and Management* **144**(8), 04018048, 💧.
28. Elmahdi, A., A. F. **Taha**, D. Sun, and J. H. Panchal (2015). Decentralized control framework and stability analysis for networked control systems. *Journal of Dynamic Systems, Measurement, and Control* **137**(5), 051006, ⬡.
29. **Taha**, A. F., A. Elmahdi, J. H. Panchal, and D. Sun (2015). Unknown input observer design and analysis for networked control systems. *International Journal of Control* **88**(5), 920–934, ⬡.
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Journal articles under review

1. Guo, Y., S. Wang, A. F. **Taha**, and T. Summers. Optimal Pump Schedule for Water Distribution Networks via Data-Based Distributional Robustness. *IEEE Transactions on Control Systems Technology*. In review, **first round**, 💧,⬡.

2. Nugroho, S. A., A. F. **Taha**, N. Gatsis, and J. Zhao. Observers for Differential Algebraic Equation Models of Power Networks. *IEEE Transactions on Control of Network Systems*. In review, **second round**, ϟ.
3. Nugroho, S. A., S. Vishnoi, A. F. **Taha**, C. Claudel, and T. Banerjee. Where Should Traffic Sensors Be Placed on Highways? *IEEE Transactions on Intelligent Transportation Systems*. In review, **third round**, 🛣.
4. Wang, S., A. F. **Taha**, A. Chakrabarty, L. Sela, and A. Abokifa. Model Order Reduction for Water Quality Dynamics. *Water Resources Research*. In review, second round 💧.
5. Nugroho, S. A. and A. F. **Taha** (2021). Load and Renewable-Following Control of Linearization-Free Differential Algebraic Equation Power System Models. *IEEE Transactions on Control Systems Technology*. In review, first round, ϟ.
6. Wang, S., A. F. **Taha**, and A. Chakrabarty (2021). Data-Driven Identification of Dynamic Quality Models in Drinking Water Networks. *Journal of Water Resources Planning and Management*. In review, first round, 💧.

Conference papers

1. Ayyagari, K., S. Wang, N. Gatsis, A. F. **Taha**, and M. Giacomoni (2021). Co-Optimization of Interdependent Water and Power Distribution Networks. In: *2021 IEEE Power and Energy Society Innovative Smart Grid Technologies Conference*. In press, ϟ, 💧.
2. Ayyagari, K. S., S. Wang, N. Gatsis, A. F. **Taha**, and M. Giacomoni (2021). Energy-Efficient Optimal Water Flow Considering Pump Efficiency. In: *2021 IEEE Madrid PowerTech*, pp.1–6, 💧, ϟ.
3. Nugroho, S., A. F. **Taha**, N. Gatsis, and J. Zhao (2021). On the Simultaneous Estimation of Dynamic and Algebraic States in Power Networks via State Observer. In: *2021 5th IEEE Conference on Control Technology and Applications (CCTA)*. In press, ϟ.
4. Nugroho, S., S. Vishnio, A. F. **Taha**, and C. Claudel (2021). Feedback Stabilization and Output Tracking for Discrete-Time Lipschitz Nonlinear Systems via Iterative Convex Approximations. In: *2021 American Control Conference (ACC)*. In press, ⬢.
5. Banerjee, T., E. Adib, A. Taha, and E. John (2020). Sequential Methods for Detecting a Change in the Distribution of an Episodic Process. In: *ICASSP 2020 - 2020 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, pp.6009–6013, 🛣.
6. Nugroho, S., V. Hoang, M. Radoscz, S. Wang, and A. F. **Taha** (2020). New Insights on One-Sided Lipschitz and Quadratically Inner-Bounded Nonlinear Dynamic Systems. In: *2020 American Control Conference, Denver, Colorado*. In press, ⬢.
7. Nugroho, S., S. Vishnoi, A. F. **Taha**, C. Claudel, and T. Banerjee (2020). Asymmetric Cell Transmission Model-Based, Ramp-Connected Robust Traffic Density Estimation under Bounded Disturbances. In: *2020 American Control Conference, Denver, Colorado*. In press, 🛣.
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9. Nugroho, S. A. and A. F. **Taha** (2019). On the need for sensor and actuator placement algorithms in nonlinear systems: WIP abstract. In: *Proceedings of the 10th ACM/IEEE International Conference on Cyber-Physical Systems*. ACM, pp.304–305,  .
10. Nugroho, S. A., A. F. **Taha**, and J. Qi (2019). Characterizing the Nonlinearity of Power System Generator Models. In: *2019 American Control Conference, Philadelphia, US*, pp.1936–1941,  .
11. Nugroho, S. and A. F. **Taha** (2019). Sensor Placement Strategies for Some Classes of Nonlinear Dynamic Systems Via Lyapunov Theory. In: *IEEE 58th Conference on Decision and Control (CDC), Nice, France*. To Appear,  .
12. Wang, S., A. F. **Taha**, N. Gatsis, and M. Giacomoni (2019). Geometric Programming-Based Control for Nonlinear, DAE-Constrained Water Distribution Networks. In: *2019 American Control Conference, Philadelphia, US*, pp.1470–1475,  .
13. Wang, S., A. F. **Taha**, N. Gatsis, and M. H. Giacomoni (2019). Control of water distribution networks using convex approximations: WIP abstract. In: *Proceedings of the 10th ACM/IEEE International Conference on Cyber-Physical Systems*. ACM, pp.301–301,  .
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16. Ayyagari, K. S., N. Gatsis, A. F. **Taha**, and B. Dong (2018). On Static and Adaptive Policies for Chance-Constrained Voltage Regulation. In: *2018 52nd Asilomar Conference on Signals, Systems, and Computers*. IEEE, pp.1858–1862,  .
17. Bazrafshan, M., N. Gatsis, M. Giacomoni, and A. **Taha** (2018). A fixed-point iteration for steady-state analysis of water distribution networks. In: *2018 IEEE Global Conference on Signal and Information Processing (GlobalSIP)*. IEEE, pp.880–884,  .
18. Bhounsule, P. A., A. **Taha**, and S. Nugruho (2018). Control Systems and Robotics Outreach to Middle-school Girls: Approach, Results, and Suggestions. In: *ASEE Gulf-Southwest Section Annual Conference*. **Best paper award, second place**.
19. Dong, B., A. F. **Taha**, N. Gatsis, Z. Li, and A. Pipri (2018). Impact of Occupancy-Based Buildings-to-Grid Integration on Frequency Regulation in Smart Grids. In: *2018 Annual American Control Conference (ACC)*, pp.5399–5405, .
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26. Li, Z., A. Pipri, B. Dong, N. Gatsis, A. **Taha**, and N. Yu (2017). Modelling, Simulation and Control of Smart and Connected Communities. In: *Building Simulation*, ϟ.
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