

Mohsen Rahimi, PhD



**Associate Professor, Department of Electrical and Computer Engineering,
University of Kashan, Kashan, Iran**

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Education:

Ph.D., Electrical Power Engineering, Sharif University of Technology, Tehran, Iran, Dec. 2010, Excellent degree.

Thesis Title: "Analysis and improvement of dynamic performance and low voltage ride-through capability of DFIG-based wind turbines"

Supervisor: Prof. Mostafa Parniani

M.Sc., Electrical Power Engineering, Sharif University of Technology, Tehran, Iran, Dec. 2003.

Thesis Title: "Study the effective design parameters for three phase active filters and filter size design optimization"

Supervisor: Prof. Hosein Mokhtari

B.Sc., Electrical Engineering, Esfahan University of Technology, Esfahan, Iran, Sep. 2001.

B.SC. Project: "Design and implementation of pulsing power supply"

Research Interests:

- **Modeling, control and stability analysis of wind power plants, solar-PV Systems, and renewable energy sources**
- **Dynamics, control and stability analysis of power converters, distributed generation, FACTS and custom power devices**
- **Modeling, analysis, and control of DC/AC microgrids**
- **Modeling, analysis, and control of electric machines and motor drives.**

- **Application of Power Electronics in Power Systems and Distributed Generation (FACTS Technologies, Custom Power Devices, DG Interface Converters,)**
- **Application of Control Theory in Power Electronics and Drive Applications**
- **Grid integration issues of renewable energy sources**

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Publications

1. Journal Papers

64. A. Safaeinejad, M. Rahimi, D. Zhou, F. Blaabjerg, "A sensorless active control approach to mitigate fatigue loads arising from the torsional and blade edgewise vibrations in PMSG-based wind turbine system", *International Journal of Electrical Power and Energy Systems*, vol. 155, pp. 1-20, 2024.
63. A. Khaloei, **M. Rahimi**, "Microgrid-based parallel-operated voltage-source inverters: Stability analysis and enhancement in presence of active loads", *Energy Science and Engineering*, Early View.
62. A. Beiki, **M. Rahimi**, "Mathematical representation of harmonic resonance phenomenon and harmonic compensation in PMSG based wind farms under feedforward compensation of the grid voltages", *Sustainable Energy Technologies and Assessments-Elsevier*, vol. 57, pp. 1-23, June 2023.
61. **M. Rahimi**, Morteza Momenzadeh, A. Akhbari, M. H. Khooban, "Performance enhancement of parallel-operated inverter-based virtual synchronous generators supplying active load", *IET-Electric Power Applications*, vol_17_no_6_June 2023.
60. A. Akhbari, **M. Rahimi**, M. H. Khooban, "Various Control Strategies Performance Assessment of the DFIG wind turbine connected to a DC grid", *IET-Electric Power Applications*, vol. 17, no. 5, pp. 687-708, May 2023.
59. A. H. Azizi, **M. Rahimi**, "Sub-synchronous control interaction in power grids including doubly fed induction generator based wind turbines", *IET Renewable Power Generation*, vol. 16, no. 15, pp. 1-19, Nov. 2022.
58. M. Gheisarnejad, A. Akhbari, **M. Rahimi**, B. Andrésen, M. H. Khooban, "Reducing Impact of Constant Power Loads on DC Energy Systems by Artificial Intelligence", *IEEE Trans. Circuits and Systems II: Express Briefs*, vol. 69, no. 12, pp. 4974 - 4978, Dec. 2022.
57. Y. Abdollahi, M. Rahimi, A. Halvaei-Niasar, "Control and performance assessment of grid-connected PMSG-based wind turbine equipped with diode bridge rectifier and boost converter using three different control strategies" *Scientia Iranica*, Accepted for Publication.
56. A. Safaei-najad, **M. Rahimi**, "Wind Energy Conversion System Based on Dual Stator Winding Induction Generator for Supplying Autonomous AC Load" *Energy Engineering & Management*, vol. 12, no. 1, pp. 56-63, April 2022.
55. **A. Ebrahim, M. Rahimi, A. R. Faraji**, "Control and Stability Improvement of Combined Wind-battery System with a Permanent Magnet Synchronous Generator Supplying Active Load", *Energy Engineering & Management*, vol. 13, no. 1, pp. 12-29, March 2023.
54. A. Akhbari, **M. Rahimi**, M. H. Khooban, "Direct current grid-based doubly-fed induction generator wind turbines: Real-time control and stability analysis", *IET-Power Electronics*, vol. 15, no. 12, Sep. 2022.
53. A. Beiki, **M. Rahimi**, "Mathematical modeling of PMSG-based wind power plants (WPPs) for harmonic resonance studies and analytical assessment of wind turbines converters controls on WPP harmonic resonance response", *Scientia Iranica*, vol. 30, no. 3, pp. 1106-1126, May and June 2023.
52. H. Hassantaghi, **M. Rahimi**, "Control and stability analysis of DC-microgrid system including wind and solar generation sources and grid-connected voltage source converter", *Int. Journal of Circuit Theory and Applications*, vol. 49, no. 3, pp. 1-25, March 2021.

51. A. H. Azizi, **M. Rahimi**, “Analytical assessment of subsynchronous resonance (SSR) impact on DFIG wind turbine behavior and efficient suppression of SSR oscillations”, *Int. Trans. Elec. Energy Systems*, vol. 31, no. 3, pp. 1-24, March 2021.
50. R. Zarei, **M. Rahimi**, “Coordinated and adaptive power management of AC microgrid system comprising wind and diesel generation sources and AC stand-alone load”, *Electric Power Systems Research*, vol. 192, pp. 1-14, March 2021.
49. Z. Dehghani, S. A. Taher, M. H. Karimi, **M. Rhimi**, “Coordinated model predictive DC-link voltage, current, and electromagnetic torque control of wind turbine with DFIG under grid faults”, *J. Electr. Comput. Eng. Innovations*, vol. 8, no. 2, pp. 201-218, 2020.
48. A. Safaei-najad, **M. Rahimi**, “Control and performance analysis of grid connected variable speed wind turbine with dual stator-winding induction generator for contribution of both stator windings in active power transmission”, *IET Renewable Power Generation*, vol. 14, no. 13, pp. 2348-2358, 2020.
47. A. Akhbari, **M. Rahimi**, A. Atapoor, “Control System Design and Fault-Ride-through Performance Analysis of Grid-Connected Microturbine Generation System”, (in Farsi) *Journal of Iranian Association of Electrical and Electronics Engineers*, vol. 19, no. 4, pp. 139-152, 2023.
46. A. Noori, **M. Rahimi**, “Performance and dynamic response enhancement of PMSG based wind turbines employing boost converter-diode rectifier as the machine-side converter”, *Scientia Iranica*, vol. 29, no. 3, pp. 1523-1536, May and June 2022.
45. A. Haghi, **M. Rahimi**, “Control and stability analysis of VSC-HVDC based transmission system connected to offshore wind farm”, *Scientia Iranica*, vol. 29, no. 1, pp. 193-207, 2022.
44. A. Atapoor, **M. Rahimi**, A. Akhbari, “Control and power management of combined wind-microturbine generation system in stand-alone applications”, (in Farsi), *Iranian Journal of Electrical and Computer Engineering*, Vol. 18, No. 3, Autumn 2020.
43. A. Akhbari, **M. Rahimi**, M. H. Khooban, “Efficient and seamless power management of hybrid generation system based-on DFIG wind sources and microturbine in DC microgrid”, *Sustainable Energy, Grids and Networks*, vol. 23, pp. 1-15, 2020.
42. A. Akhbari, **M. Rahimi**, “Control and stability analysis of DFIG wind system at the load following mode in a DC microgrid comprising wind and microturbine sources and constant power loads”, *International Journal of Electrical Power and Energy Systems*, vol. 117, pp. 1-15, 2020.
41. A. Ketabi, H. R. Mohammadi, **M. Rahimi**, “Using VBR model in fixed speed wind turbines and suggesting a new method for improving LVRT capability”, *Computational Intelligence in Electrical Engineering*, vol. 10, no. 1, 2019.
40. **M. Rahimi**, “Analytical assessment of the impact of stator-series passive resistive hardware (SSPRH) on transient response and fault current contribution in DFIG based wind turbines”, *Electric Power Systems Research*, vol. 177, pp. 1–12, 2019.
39. **M. Rahimi**, S. Ghadriyan, “A Generalized droop based compensator for addressing the issues raised in a DC microgrid comprising hybrid wind-battery-back up generation sources”, *International Transactions on Electrical Energy Systems*, vol. 29, pp. 1–20, 2019.
38. S. Ghadriyan, **M. Rahimi**, “Mathematical representation, stability analysis and performance improvement of DC microgrid system comprising hybrid wind/battery sources and constant power loads”, *IET Gen. Tran. & Dis.*, vol 13, no 10, pp 1845–1855, 2019.
37. **M. Rahimi**, M. Asadi, “Control and dynamic response analysis of full converter wind turbines with squirrel cage induction generators considering pitch control and drive train dynamics”, *International Journal of Electrical Power and Energy Systems*, vol. 108, pp. 280–292, 2019., [hdoi.org/10.1016/j.ijepes.2019.01.018](https://doi.org/10.1016/j.ijepes.2019.01.018).
36. **M. Rahimi**, A. Azizi, “Transient behavior representation, contribution to fault current assessment, and transient response improvement in DFIG based wind turbines assisted with crowbar hardware”, *International Transactions on Electrical Energy Systems*, DOI: 10.1002/etep.2698.
35. A. Beiki, **M. Rahimi**, “An efficient sensorless approach for energy conversion enhancement and damping response improvement in PMSG based wind turbines”, *International Transactions on Electrical Energy Systems*, DOI: 10.1002/etep.2684.
34. H. Mahvash, S.A. Taher, **M. Rahimi**, M. Shahidehpour, “Enhancement of DFIG performance at high wind speed using fractional order PI controller in pitch compensation loop”, *International Journal of Electrical Power and Energy Systems*, vol. 104, pp. 259–268, 2019.

33. S.A. Taher, Z. Dehghani, **M. Rahimi**, M. Shahidehpour, "A new approach using combination of sliding mode control and feedback linearization for enhancing fault ride through capability of DFIG-based WT", *International Transactions on Electrical Energy Systems*, DOI: 10.1002/etep.2613.
32. **M. Rahimi**, A. Beiki, "Efficient modification of the control system in PMSG based wind turbine for improvement of the wind turbine dynamic response and suppression of torsional oscillations", *International Transactions on Electrical Energy Systems*, vol. 28, pp. 1-16, 2018 (DOI: 10.1002/etep.2578).
31. A. H. Azizi, **M. Rahimi**, "Dynamic performance analysis, stability margin improvement and transfer power capability enhancement in DFIG based wind turbines at weak ac grid conditions", *International Journal of Electrical Power and Energy Systems*, vol. 99, pp. 434-446, 2018.
30. **M. Rahimi**, A. Haghi, M. Belali, "Comparison of Machine side Converter Control Methods in PMSG based Wind Turbines", *Tabriz Journal of Electrical Engineering*, Accepted for Publication.
29. M. Rashidian, B. Ganji, **M. Rahimi**, "Evaluation and Control of Effective Factors in Power Oscillations Emission for Variable-Speed Wind Turbine with Doubly Fed Induction Generator", *Tabriz Journal of Electrical Engineering*, Accepted for Publication.
28. H. Mahvash, S.A. Taher, **M. Rahimi**, M. Shahidehpour, "DFIG Performance Improvement in Grid Connected Mode by Using Fractional Order [PI] Controller", *International Journal of Electrical Power and Energy Systems*, vol. 96, pp. 398-411, 2018.
27. S.A. Taher, Z. Dehghani, **M. Rahimi**, M. Shahidehpour, "Model predictive fuzzy control for enhancing FRT capability of DFIG-based WT in real-time simulation environment", *Springer-Energy Systems*, DOI 10.1007/s12667-017-0252-x.
26. **M. Rahimi**, "Improvement of energy conversion efficiency and damping of wind turbine response in grid connected DFIG based wind turbines", *Electrical Power and Energy Systems-Elsevier*, vol. 95, pp. 11-25, 2018.
25. M. H. Mahlooji, H. R. Mohammadi, **M. Rahimi**, "A review on modeling and control of grid-connected photovoltaic inverters with LCL filter", *Renewable and Sustainable Energy Reviews*, vol. 81, pp. 563-578, 2018.
24. **Mohsen Rahimi**, "Mathematical modeling, dynamic response analysis and control of PMSG based wind turbines operating with an alternative control structure in power control mode", *International Transactions on Electrical Energy Systems*, vol. 27, pp. 1-18, 2017.
23. H. Mahvash, S.A. Taher, **M. Rahimi**, M. Shahidehpour, "A new approach for mitigating blade passing effects and power quality improvement of grid-connected DFIG in wind energy conversion", *Journal of Renewable and Sustainable Energy*, vol. 9, 2017.
22. Allahyar Akhbari, **Mohsen Rahimi**, "Performance and stability analysis of grid connected single phase inverters used in solar photovoltaic systems", *Scientia Iranica*, Article in Press.
21. **M. Rahimi**, "Modeling, control and stability analysis of grid connected PMSG based wind turbine assisted with diode rectifier and boost converter", *Electrical Power and Energy Systems-Elsevier*, vol. 93, pp. 84-96, 2017.
20. **M. Rahimi**, "Coordinated control of rotor and grid sides converters in DFIG based wind turbines for providing optimal reactive power support and voltage regulation", *Sustainable Energy Technologies and Assessments-Elsevier*, vol. 20, pp. 47-57, 2017.
19. **M. Rahimi**, H. Assari, "Addressing and assessing the issues related to connection of the wind turbine generators to the distribution grid", *Electrical Power and Energy Systems-Elsevier*, vol. 86, pp. 138-153, 2017.
18. **M. Rahimi**, "Control and performance assessment of variable rotor resistance based wind turbines regarding the aerodynamic power fluctuations", *Scientia Iranica*, vol. 25, no. 3, pp. 1593-1607, 2018.
17. **M. Rahimi**, M. R. Esmaili, "Power controller design and damping improvement of torsional oscillations in the 710 kW DFIG based wind turbine installed at the Binalood site", *Tabriz Journal of Electrical Engineering*, vol. 46, pp. 123-134, 2016 (In Farsi).
16. **M. Rahimi**, "Analysis of grid-side converter dynamics and dc-link controller design in DFIG-based wind turbines", *Journal of Energy Engineering Management, Kashan University*, vol. 6, no. 1, 2016, pp. 16-27 (In Farsi).
15. **M. Rahimi**, "Drive train dynamics assessment and speed controller design in variable speed wind turbines", *Renewable Energy-Elsevier*, Vol. 89, 2016, pp. 716-729.
14. **M. Rahimi**, "Discussion on "Virtual damping flux-based LVRT control for DFIG-based wind turbine", *IEEE Trans Energy Convers.*, Vol. 13, No.1, March 2016.

13. **M. Rahimi**, A. Karimi, M. Fotuhi-Firuz abad, "Short Term Voltage-Based Risk Assessment by incorporating Reactive Power Adequacy", *Ain Shams Engineering Journal- Elsevier*, Vol. 7, No. 1, March 2016, pp. 131-141.
12. S. Tohidi, H. Oraee, M. R. Zolghadri, and **M. Rahimi**, "A control scheme to enhance low voltage ride-through of brushless doubly-fed induction generators", *Wind Energy- Wiely* (2015), Article in Press.
11. H. Mahvash, S. A. Taher, **M. Rahimi**, "A new approach for power quality improvement of DFIG based wind farms connected to weak utility grid", *Ain Shams Engineering Journal- Elsevier* (2015), Article in Press.
10. **M. Rahimi**, "Dynamic performance assessment of DFIG-based wind turbines: A review" *Renewable & Sustainable Energy Reviews-Elsevier*, Vol. 37, 2014, pp. 852–866.
9. **M. Rahimi**, "Analysis and Improvement of Unbalanced Fault Ride-Through Response in DFIG-based Wind Turbines", *Journal of Energy Engineering and Mangement, Kashan University*, Vol. 4, No. 1, 2014 (In Farsi).
8. **M. Rahimi**, M. Parniani, "Low voltage ride-through capability improvement of DFIG-based wind turbines under unbalanced voltage dips" *Electrical Power and Energy Systems*, Vol. 60, 2014, pp. 82-95.
7. **M. Rahimi**, M. Parniani, "Coordinated Control Approaches for Low-Voltage Ride-Through Enhancement in Wind Turbines With Doubly Fed Induction Generators" *IEEE Trans Energy Convers.*, Vol. 25, No. 3, Sep. 2010, pp. 873-883.
6. **M. Rahimi**, M. Parniani, "Transient Performance Improvement of Wind Turbines With Doubly Fed Induction Generators Using Nonlinear Control Strategy" *IEEE Trans Energy Convers.*, Vol. 25, No. 25, Jun. 2010, pp. 514-525.
5. **M. Rahimi**, M. Parniani, "Efficient Control Scheme of Wind Turbines with Doubly-Fed Induction Generators for Low Voltage Ride-Through Capability Enhancement" *IET Renew. Power Gener.*, 2010, Vol. 4, Iss. 3, pp. 242–252.
4. **M. Rahimi**, M. Parniani, "Grid-fault ride-through analysis and control of wind turbines with doubly fed induction generators" *Electric Power Systems Research-Elsevier*, Vol. 80, 2010, pp. 184–195.
3. **M. Rahimi**, M. Parniani, "Dynamic behavior analysis of doubly-fed induction generator wind turbines – The influence of rotor and speed controller parameters" *Electrical Power and Energy Systems-Elsevier*, Vol. 32, 2010, pp. 464–477.
2. **M. Rahimi**, M. Parniani, "Dynamic behavior and transient stability analysis of fixed speed wind turbines" *Renewable Energy-Elsevier*, Vol. 34, 2009, pp. 2613–2624
1. **M. Rahimi**, H. Mokhtari, Gh. Zafarabadi, "A New Active method in damping possible Resonance in Active Filters", *Iranian Journal of Electrical and Computer Engineering*, Vol. 7, No. 1, Winter/Spring 2008.

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Teaching Experience at University of Kashan

Under Graduate:

- **Electrical Machines 1**
- **Electrical Machines 2**
- **Special Machines**
- **Industrial Electronics**
- **Fundamental of Electrical Engineering II**

Graduate:

- **Renewable Energy Sources (Modeling and control of grid-connected wind and solar-PV sources)**

- **Flexible AC Transmission Systems (FACTS)**

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Industrial Experiences

- Control of full converter wind turbines with PMSG, Mapna Group, 2021.
- Design and implementation of a 400 Hz single phase inverter
- Consultant of Sabaniroo Co (wind turbine manufacture in Iran), from 2010-2012.
- Study regarding the grid integration of wind turbine generators in Iran.
- Design and Simulation of Controllers for application in DFIG and limited variable speed wind turbines.
- Analysis & Direction of Harmonic and Flicker sources in some distribution and transmission substations of Iran. (Niroo Consulting Engineers, 2004-2005).
- Dynamic Equivalency of Iran Unified Electrical Network. (Niroo Research Institute, System Operation Group, 2002)
- Implementation of pulse power supply, (Information and Communication Technology Institute, Isfahan University of Technology, 2001.)

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PhD Thesis Supervision

1. Ashkan Beiki, “Harmonic resonance analysis and dynamic performance improvement of PMSG based wind turbines”, PhD Thesis, Oct. 2019.
2. Amir Hossein Azizi, “Stability analysis and dynamic performance improvement of DFIG-based wind turbines at weak grid condition”, PhD Thesis, May 2020.
3. Allahyar Akhbari, “Control and Stability analysis of DC Microgrid Comprising DFIG Wind Energy Sources and Constant Power Loads”, PhD Thesis, Aug. 2020.

Master Thesis Supervision

23. **Title:** “Unified control of DFIG-based wind turbine with battery energy storage system in grid-connected and stand-alone conditions”, MSc Thesis, Apr 2022 (Supervisor).
- 22- **Title:** “Control and performance analysis of parallel inverters feeding stand-alone load using virtual synchronous generator(VSG) approach”, MSc Thesis, Oct. 2021 (Supervisor).
- 21- **Title:** “Sensorless Control of Grid Connected Doubly fed Induction Generator Based Wind Turbine”, MSc Thesis, Oct. 2021 (Supervisor).
- 20- **Title:** “Control and Stability Analysis of Parallel Inverters in AC Microgrid Comprising Active Loads”, MSc Thesis, Feb. 2021 (Supervisor).
- 19- **Title:** “Coordinated control of diesel generator and DFIG based wind turbines in an AC-microgrid for feeding stand-alone load”, MSc Thesis, Nov. 2019 (Supervisor).
- 18- **Title:** “Control and Stability Analysis of DC-Microgrid System including Wind and Solar Generation Sources and Grid Connected Inverter”, MSc Thesis, May 2019 (Supervisor).

- 17- **Title:** “Modeling and control of wind turbine with dual stator winding induction generator”, MSc Thesis, March 2019 (Supervisor).
- 16- **Title:** “Coordinated Control of Microturbine and DFIG based Wind Turbine in a DC Microgrid”, MSc Thesis, Nov. 2018 (Supervisor).
- 15- **Title:** “Control of combined wind-microturbine generation system in grid connected and stand-alone applications”, MSc Thesis, March 2018 (Supervisor).
- 14- **Title:** “Control, Power Management and Stability Analysis of DC Microgrid Including Wind Energy Source and Constant Power Loads”, MSc Thesis, Sep 2017 (Supervisor).
- 13- **Title:** Modeling, control and dynamic performance analysis of full converter wind turbine with squirrel cage induction generator”, MSc Thesis, Apr 2017 (Supervisor).
- 12- **Title:** “Modeling and control of offshore wind farms connected to VSC-HVDC transmission systems”, MSc Thesis, Jan 2017. (Supervisor)
- 11- **Title:** “Control of single phase inverter in stand alone and grid connected applications”, Jan 2016. (Supervisor)
- 10- **Title:** “Modeling and control of hybrid PV-FC system in a DC microgrid”, MSc Thesis, Dec 2015. (Supervisor)
- 9- **Title:** “Integration of fixed speed wind turbines into distribution grid: assessing and addressing the grid integration issues”, MSc Thesis, Oct 2015. (Supervisor)
- 8- **Title:** “Comparison of different control strategies in PMSG based wind turbines from torsional oscillations point of view”, MSc Thesis, Oct 2015. (Supervisor)
- 7- **Title:** “Power controller design and damping improvement of electromechanical oscillations in DFIG-based wind turbines”, MSc Thesis, Nov 2014. (Supervisor)
- 6- **Title:** “Mitigation of power fluctuation in variable-speed wind turbine with doubly-fed induction generator”, May 2017. (Advisor)
- 5- **Title:** “Improvement of power quality indices in a grid with DFIG based wind turbines”, MSc Thesis, June 2014. (Advisor)
- 4- **Title:** “Modeling and controller design for grid connected inverter with output LCL filter in a photovoltaic system”, MSc Thesis, Sep 2015. (Advisor)
- 3- **Title:** “Controller design for LVRT capability improvement in DFIG based wind turbines”, MSc Thesis, Sep 2015. (Advisor)
- 2- **Title:** “Improvement of low voltage ride-through capability in PMSG based wind turbines”, MSc Thesis, Dec 2015. (Advisor)
- 1- **Title:** “Estimation of aerodynamic curve, improvement of power profile and pitch angle controller design for DFIG-710 kW wind turbine in the Binalood site”, MSc Thesis, Jan 2016. (Advisor)

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Awards and Honors

- Listed in world top 2% scientists list indentified by Stanford University at 2023 (Single year impact and Career long impact)
- Listed in world top 2% scientists list indentified by Stanford University at 2022 (Single year impact and Career long impact)
- Listed in world top 2% scientists list indentified by Stanford University at 2021 (Single year impact and Career long impact)
- Distinguished Researcher Award, University of Kashan, Dec. 2014.
- Distinguished Teaching Award, University of Kashan, Apr. 2015.

- Distinguished Researcher Award, University of Kashan, Dec. 2016.
- Distinguished Teaching Award, University of Kashan, Apr. 2018.
- Distinguished Researcher Award, University of Kashan, Dec. 2018.
- Distinguished Researcher Award, University of Kashan, Dec. 2022.

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