Taha EL HAJJI

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GoogleScholar | ORCID | LinkedIn | X | Github | ResearchGate

Experience

- Alvier Mechatronics [🌐] — April 2025 - Present
  Senior Application Specialist on Electric Machines — Skåne, Sweden
  - Design and optimization of electric machines.
- IMRA [🌐] - UK Research Centre Branch of AISIN [🌐] — May 2024 - Mar 2025
  Electromagnetic Research Engineer — Brighton, United Kingdom
  - Design of electric machines for next generation of electric vehicles for AISIN Seiki.
- Aalto University [🌐] — June 2022 - Apr 2024
  Postodoctoral Researcher — Espoo, Finland
  - Research on high speed electric machines for transport electrification.
  - Teaching lectures, exercises, and practical sessions.
- Cnam Engineering School[🌐] — Jan 2021 - May 2022
  Teacher — Paris, France
  - Supervising practical sessions for graduate students in Electrical Engineering.
- Stellantis [🌐] — Feb 2019 - May 2022
  Research and Development Engineer — Velizy, France
  - Industrial PhD: Research on high speed electric machines for electric vehicles.
- Stellantis [🌐] — Jan 2018 - Sept 2018
  Internship — Velizy, France
  - Master Thesis: Modeling Analysis of Innovative Hybrid Electric Vehicles.
- University of Paris-Cité [🌐] — Oct 2017 - May 2018
  Teacher — Paris, France
  - Tutor of Mathematics for Undergraduate Students.
- Akkodis [🌐] — Jun 2017 - Sept 2017
  Internship — Blagnac, France
  - Bachelor Thesis: Analytical sizing of input PWM's Filter for mass optimization of the drone Omega.

Education

- University of Paris-Saclay [🌐] (Faculty: E.N.S Paris-Saclay [🌐]): — Feb 2018 - May 2022
  PhD in Electrical Engineering — Gif-sur-Yvette, France
  - Modeling and optimization of high speed electric machines for electric vehicles (In collaboration with Stellantis).
- E.N.S Paris-Saclay [🌐] and I.F.P School [🌐]: — Sept 2017 - Sept 2018
  MSc by Research on Automotive Propulsion and Electrification — Gif-sur-Yvette & Rueil-Malmaison, France
  - Electric Machines, Power Electronics, Optimization, Gearbox.
- ENSEEIHT [🌐]: — Sept 2015 - Sept 2018
  MSc in Electrical Engineering — Toulouse, France
  - Electrical Machines, Power Electronics, Control.
- University of Toulouse III - Paul Sabatier [🌐]: — Sept 2015 - June 2016
  BSc in Fundamental Mathematics — Toulouse, France
  - Linear Algebra, Probability, Functional Analysis, Topology.
- Lycée Pothier [🌐] and Lycée Henri-Poincaré [🌐]: — Sept 2012 - June 2015
  Preparatory Classes (equiv. to First 3 years of Undergraduate studies) — Orléans & Nancy, France
  - Mathematics, Physics, Programming.

Teaching

Total Teaching of 242 hours = 202h in Electrical Engineering + 40h in Mathematics

- Aalto University [🌐] — Jan 2024 - Feb 2024
  Master in Electrical Engineering (45h) — Espoo, Finland
  - Numerical Methods in Electromechanics 2 (ELEC-E8411).
- Aalto University [🌐] — Sept 2023 - Dec 2023
  Master in Electrical Engineering (20h) — Espoo, Finland
  - Electromechanics: practical work on Induction Machine, (ELEC-E8407).
- Aalto University [🌐] — Jan 2023 - Feb 2023
  Master in Electrical Engineering (45h) — Espoo, Finland
  - Numerical Methods in Electromechanics 1 (ELEC-E8411).
- Aalto University [🌐] — Sept 2022 - Dec 2022
  Master in Electrical Engineering (20h) — Espoo, Finland
  - Electromechanics: practical work on Transformer (ELEC-E8407).
- Cnam Engineering School [🌐] — Jan 2022 - May 2022
  Master in Electrical Engineering (35h) — Paris, France
  - Electrotechnics: practical work on electric machines, transformers, and converters.
- Cnam Engineering School [🌐] — Jan 2021 - May 2021
  Master in Electrical Engineering (35h) — Paris, France
  - Electrotechnics: practical work on electric machines, transformers, and converters.
- University of Paris-Cité [🌐] — Oct 2017 - May 2018
  Bachelor in Mathematics (40h) — Paris, France
  - Fundamental Mathematics: Tutoring of Undergraduate students.

Supervision

Total Supervision of 13 months = 2 Master Thesis + Bachelor Thesis

- Aalto University [🌐] — June 2023 - Sept 2023
  Master Thesis (4 months) — Espoo, Finland
  - Optimization of a traction chain for an Electric Vehicle considering the cost.
- Aalto University [🌐] — June 2023 - Aug 2023
  Bachelor Thesis (3 months) — Espoo, Finland
  - Design and creation of the websites for the Electromechanics research group and the research project CoE-HiECSs.
- E.N.S Paris-Saclay [🌐] — Apr 2021 - Sept 2021
  Master Thesis (6 months) — Gif-sur-Yvette, France
  - Experimental Evaluation of AC Losses in Slot's Windings at high frequency.

Honors and Awards

- Young Author Award — June 2019
  IFAC AAC Conference 2019 — Orléans, France
  - Awarded paper: Sensitivity Analysis on the Sizing Parameters of a Series-Parallel HEV [🌐].

Research Volunteer Experience

- Reviewer — 2023 - Present
  - Journals: IEEE TTE, IEEE OJIES, IEEE IAS, IEEE TMag, Arch. of Elec. Eng.
  - Conferences: ICEM, ITEC (USA), CEFC, IEEE AtC-AtG.

- Organizing Committee [🌐] — 2024
  Conference IEEE AtC-AtG on Magnetism 2024 [🌐] — Online
  - Responsibility in EMEA region: Presentation scheduling, Advertising, Abstract handling, Communications.

- Chairman — 2024
  Conference IEEE AtC-AtG on Magnetism 2024 [🌐] — Online
  - Chairman of EMEA Session on Magnetism.

- Scientific Communication — 2022 - 2024
  - Scientific communication of Electromechanics Research Group at Aalto University: design of webpage, research work diffusion on Linkedin page, and research group on ResearchGate.
  - Scientific communication of the project CoE-HiECSs: design of webpage and research work diffusion on Linkedin page.
  - Communication of the conference IEEE AtC-AtG on Linkedin page.
  - Scientific communication of personal research work on Linkedin, X, and personal website.

- Co-Chair — 2020
  Conference EPE 2020 – ECCE: European Conference on Power Electronics [🌐] — Online
  - Co-chair of session on Measurement, Supervision and Control for Power Converters.

Skills

- Programming: Python, Matlab, Simulink.
- Finite Element Softwares: JMAG, ANSYS Electronics, MotorCAD, COMSOL Multiphysics, Femm.
- Specialized Areas: Experimental Methods, Mathematical Tools, Theory, Numerical Analysis.
- Research Skills: Critical Thinking, Analysis, Attention to details, Collaboration, Time Management.

Languages

English: Fluent.
French: Mother Tongue.
German: Basic Knowledge.

Hobbies

Guitar (8y), Music Theory (9y), Taekwondo (3y), Brazilian Jiu Jitsu (1y), Kung-Fu (1y), Swimming (12y), Soccer (10y), Chess, Sudoku.

3 Selected Publications

1 T. El Hajji, S. Hlioui, F. Louf, M. Gabsi, A. Belahcen, G. Mermaz-Rollet and M. Belhadi (2024). AC Losses in Windings: Review and Comparison of Models With Application in Electric Machines. IEEE Access, Vol. 12, pp. 1552-1569. DOI: 10.1109/ACCESS.2023.3345014

2 T. El Hajji, A. Hemeida, A. Lehikoinen, F. Martin and A. Belahcen (2024). Optimal Design of High Specific Power Electric Machines for Fully Electric Regional Aircraft: A Case Study of 1MW S-PMSM. Aerospace, Vol. 11, Issue 10, pp. 820. DOI: 10.3390/aerospace11100820

3 T. El Hajji, S. Hlioui, F. Louf, M. Gabsi, G. Mermaz-Rollet and M. Belhadi (2024). Optimal Design of High-Speed Electric Machines for Electric Vehicles: A Case Study of 100 kW V-Shaped Interior PMSM . Machines, Vol. 11, Issue 57. DOI: 10.3390/machines11010057

All Publications

A=arxiv, C=Conference, J=Journal, P=Patent, R=Repository, S=In Submission, T=PhD Thesis

[A.1] T. El Hajji, A. Lehikoinen and A. Belahcen (2024). Circulating Currents in Windings: Fundamental Property. arXiv, eess.SY. DOI: 10.48550/arXiv.2410.12748

[A.2] T. El Hajji, A. Lehikoinen and A. Belahcen (2024). Circulating Currents in Electric Machines: Positive Impact of The End Windings Length on Losses. arXiv, eess.SY. DOI: 10.48550/arXiv.2411.07235

[C.1] T. El Hajji, A. Lehikoinen, A. Hemeida and A. Belahcen (2024). Optimal Design of Cost-effective E-Machines for Traction: A Case Study of 150kW V-shaped PMSM. In 2024 International Conference on Electrical Machines (ICEM), pp. 1-5, 2024, Torino, Italy. DOI: 10.1109/ICEM60801.2024.10700405

[C.2] T. El Hajji, A. Hemeida, A. Lehikoinen, F. Martin and A. Belahcen (2023). Benchmark of High-Speed Electric Machines for Fully Electric Regional Aircraft Targeting 20kW/kg Specific Power. In Compumag, (not published), 2023, Kyoto, Japan.

[C.3] T. El Hajji, S. Hlioui, F. Louf, M. Gabsi, G. Mermaz-Rollet and M. Belhadi (2020). Hybrid model for AC Losses in High Speed PMSM for arbitrary flux density waveforms. In 2020 International Conference on Electrical Machines (ICEM), pp. 2426-2432, 2020, Gothenburg, Sweden. DOI: 10.1109/ICEM49940.2020.9271017

[C.4] T. El Hajji, B. Kabalan, Y. Cheng, E. Vinot and C. Dumand (2019). Sensitivity Analysis on the Sizing Parameters of a Series-Parallel HEV. In 9th IFAC Symposium on Advances in Automotive Control AAC 2019, pp. 2405-8963, 2019, Orléans, France. DOI: 10.1016/j.ifacol.2019.09.065

[J.1.S] H. Canseven, T. El Hajji, A. Hemeida, A. Lehikoinen, I. Petrov, J. Pyrhönen and A. Belahcen (2025). Optimization and Performance Comparison of Inner Rotor and Outer Rotor PMSMs: A Study of High-Speed High-Specific Power Machines. Manuscript submitted for publication in IEEE Trans. on Industry Applications.

[J.2.S] T. El Hajji, D. Michieletto, A. Lehikoinen, L. Alberti and A. Belahcen (2025). Cogging Torque Mitigation of Interior Permanent Magnet Machine for Regional Electric Aircraft. Manuscript submitted for publication in IEEE Access.

[J.3] T. El Hajji, A. Hemeida, A. Lehikoinen, F. Martin and A. Belahcen (2024). Optimal Design of High Specific Power Electric Machines for Fully Electric Regional Aircraft: A Case Study of 1MW S-PMSM. Aerospace, Vol. 11, Issue 10, pp. 820. DOI: 10.3390/aerospace11100820

[J.4] T. El Hajji, S. Hlioui, F. Louf, M. Gabsi, A. Belahcen, G. Mermaz-Rollet and M. Belhadi (2024). AC Losses in Windings: Review and Comparison of Models With Application in Electric Machines. IEEE Access, Vol. 12, pp. 1552-1569. DOI: 10.1109/ACCESS.2023.3345014

[J.5] T. El Hajji, S. Hlioui, F. Louf, M. Gabsi, G. Mermaz-Rollet and M. Belhadi (2024). Optimal Design of High-Speed Electric Machines for Electric Vehicles: A Case Study of 100 kW V-Shaped Interior PMSM . Machines, Vol. 11, Issue 57. DOI: 10.3390/machines11010057

[J.6] B. Kabalan, E. Vinot, C. Yuan, R. Trigui, C. Dumand and T. El Hajji (2019). Efficiency Improvement of a Series–Parallel Hybrid Electric Powertrain by Topology Modification. EEE Transactions on Vehicular Technology, Vol. 68, Issue 12, pp. 11523-11531. DOI: 10.1109/TVT.2019.2952190

[R.1] T. El Hajji, A. Lehikoinen and A. Belahcen (2024). GeoPaMotor, Open Source Code, GitHub [].

[T.1] T. El Hajji (2023). Modeling and optimization of high speed electric machines for electric vehicles. PhD, Electrical Engineering, University of Paris-Saclay.