

# Taha EL HAJJI

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## Experience

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- AISIN [🌐] May 2024 - Present  
Electromagnetic Research Engineer London, United Kingdom
  - Design of electric machines for next generation of electric vehicles.
- Aalto University [🌐] June 2022 - Apr 2024  
Postdoctoral 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

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- 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 240 hours = 200h in Electrical Engineering + 40h in Mathematics


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

## Supervision

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

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

## Honors and Awards

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

## Research Volunteer Experience

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- 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

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

## Languages

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English: Fluent.

French: Mother Tongue.

German: Basic Knowledge.

## Hobbies

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

## arXiv

- [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


## Conference

- [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

## Journal

- [J.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
- [J.3] 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.4] 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.5] 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](#). IEEE Transactions on Vehicular Technology, Vol. 68, Issue 12, pp. 11523-11531. DOI: 10.1109/TVT.2019.2952190

## Repository

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

## Thesis

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