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Maxime Sabbah

Education

Oct. 2022–Nov. 2025 **Ph.D. in Robotics**, *Université de Toulouse*, Toulouse, France
Title: Toward more ergonomical human-robot collaborations

Sept. 2018–Dec. 2022 **MSc. in Aeronautics**, *ISAE-SUPAERO*, Toulouse, France

Oct. 2020–Oct. 2021 **MSc. in Biomedical Engineering**, *Imperial College London*, London, UK

Research Interests

Understanding what **drives human motion** and how to **accurately estimate** it from a few affordable sensors. Enabling robots to **efficiently physically interact and cooperate with humans** in a safe, ergonomic, and assistive way. Focus on **learning approaches** (VLA) to make robots **more adaptable and efficient**.

Publications (*equal contribution)

Preprints

[P1] Kahina Chalabi, **Maxime Sabbah**, Nicolas Gouget, Mohamed Adjel, Guilhem Saurel, Krzysztof Wojciechowski, Bruno Watier, Vincent Bonnet. "COMFI: A Multimodal Industrial Human Motion Dataset for Markerless Motion Capture and Collaborative Robotics". Submitted to International Journal of Robotics Research (IJRR). 2025 [HAL]

Conference Proceedings

[C9] Wanchen Li, Kahina Chalabi, **Maxime Sabbah**, Thomas Bousquet, Robin Passama, Sofiane Ramdani, Andrea Cherubini, Vincent Bonnet. "Biomechanically consistent real-time action recognition for human-robot interaction". In: *2025 IEEE 21st International Conference on Robotics and Biomimetics (ROBIO)*. IEEE. 2025 [HAL]

[C8] **Maxime Sabbah**, Krzysztof Wojciechowski, Harold Soh, David Hsu, Ludovic Righetti, Nicolas Mansard, Bruno Watier, Vincent Bonnet. "Optimal Motion Prediction for Human-to-Robot Handovers". In: *2025 IEEE 21st International Conference on Robotics and Biomimetics (ROBIO), **Award Finalist***. IEEE. 2025 [HAL]

[C7] **Maxime Sabbah**, Filip Bečanović, Sarmad Mehrdad, Ludovic Righetti, Bruno Watier, Vincent Bonnet. "Minimal Observations Inverse Reinforcement Learning for Predicting Human Box-Lifting Motions". In: *2025 IEEE-RAS 24th International Conference on Humanoid Robots (Humanoids)*. IEEE. 2025, pp. 491–498 [HAL]

[C6] Zoé Pomarat, Kahina Chalabi, **Maxime Sabbah**, John-Eric Dufour, Jean-Charles Passieux, Bruno Watier. "Estimation of ground reaction forces in rugby scrummaging using instrumented insoles and machine learning". In: *3D Analysis of Human Movement, Rehabilitation, Sports Medicine and Biomechanics*. 2024 [HAL]

[C5] Kahina Chalabi, Mohamed Adjel, Thomas Bousquet, **Maxime Sabbah**, Bruno Watier, Vincent Bonnet. "Lower Limbs 3D Joint Kinematics Estimation From Force Plates Data and Machine Learning". In: *2024 IEEE-RAS 23rd International Conference on Humanoid Robots (Humanoids)*. 2024, pp. 874–879 [HAL]

[C4] Mohamed Adjel, **Maxime Sabbah**, Raphael Dumas, Marta Mirkov, Nicolas Mansard, Samer Mohammed, Vincent Bonnet. "Lower limbs human motion estimation from sparse multi-modal measurements". In: *2024 10th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob)*. 2024, pp. 401–406 [HAL]

[C3] **Maxime Sabbah**, Raphael Dumas, Zoe Pomarat, Lucas Robinet, Mohamed Adjel, Bruno Watier, Vincent Bonnet. "Ground reaction forces and moments estimation from embedded insoles using machine learning regression models". In: *2024 10th IEEE RAS/EMBS International Conference for Biomedical Robotics and Biomechatronics (BioRob)*. 2024, pp. 154–159 [HAL]

[C2] Thanh DV Nguyen, Vincent Bonnet, **Maxime Sabbah**, Maxime Gautier, Pierre Fernbach, Florent Lamiraux. "FIGAROH: a Python toolbox for dynamic identification and geometric calibration of robots and humans". In: *2023 IEEE-RAS 22nd International Conference on Humanoid Robots (Humanoids)*. 2023, pp. 1–8 [HAL]

[C1] Mohamed Adjel, **Maxime Sabbah**, Raphael Dumas, Nicolas Mansard, Samer Mohammed, Bruno Watier, Vincent Bonnet. "Multi-modal upper limbs human motion estimation from a reduced set of affordable sensors". In: *2023 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*. 2023, pp. 10926–10932 [HAL]

Journal Articles

[J1] **Maxime Sabbah**, Bruno Watier, Raphael Dumas, Maxime Gautier, Vincent Bonnet. "Concurrent validity of embedded solutions for whole body dynamics analysis". In: *IEEE Sensors Journal* (2024) [HAL]

Research Experience

Nov. 2025–Present **Postdoctoral Researcher**, *LAAS-CNRS*, Toulouse, France, Advised by Prof. Nicolas Mansard
Integrations and demonstrations for the european project AGIMUS. Focus on VLAs for fine manipulation.

Oct. 2022–Nov. 2025 **Ph.D. Candidate**, *Université de Toulouse*, Toulouse, France, Advised by Prof. Vincent Bonnet and Prof. Bruno Watier
Collaborative robotics, human motion analysis, human motion prediction, model predictive control.

Oct. 2024–Dec. 2024 **Visiting Researcher, CLeAR Lab, School of Computing**, *National University Singapore*, Singapore
Inverse Reinforcement Learning, assistance for visually impaired people, model predictive control.

Jan. 2021–Oct. 2021 **Research Intern, Human Robotics Lab**, *Imperial College London*, London, UK, Advised by Dr. Sajeeva Abeywardena and Prof. Etienne Burdet
Cable robots, haptics, rehabilitation.

Academic Services

2023–Present Reviewer: IEEE RA-L, IEEE T-RO (Journal), IEEE Humanoids, IROS, ICRA (Conference).

Teaching

2024 TA, UT3-FSI Automatique L3

2024 TA, UT3-FSI Real-time programming in C

2025 TA, IUT GEII Introduction to robotics

Skills

Programming Python, C/C++, Java, HTML, LaTeX

Frameworks PyTorch, Git, Reveal, Nix, OpenCV, ROS(1&2)

Platforms Franka Emika Panda, Vicon, Xsens, Novel (insoles)

Invited Talks

[T1] Estimating human state for human-robot ergonomic box lifting task, CNRS-AIST JRL (Joint Robotic Laboratory), Tsukuba, Japan, May 2024.