Séverin Lemaignan

Cognition for Social Robotics

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36 years old

Scientific Focus: **Robot cognition and decision making for safe social interaction**: data-driven understanding of social interactions; explainable AI; ethics of safe human-robot interactions; robust human-robot multi-modal interaction; symbolic and sub-symbolic knowledge representation.

Keywords: **Social Robotics**, **Robotic Cognition**, **Safe & Robust Human-Robot Interaction**, **Cognitive Architectures**

Education & Research Activities

Apr. 2018– **Senior Research Fellow in Robotics and Artificial Intelligence**, *Bristol Robotics Lab, United Kingdom*.
Supervision of the Human-Robot Interaction research group; Supervision of the Driverless Vehicle research group.
Directly managing 20+ students and early career researchers.

2017–2018 **Lecturer in Robotics**, *Plymouth University, Plymouth, United Kingdom*.

2015–2017 **EU Marie Skłodowska-Curie Post-doctoral fellow**, *Centre for Neural Systems and Robotics, Plymouth University, Plymouth, United Kingdom*.
Development and Implementation of a Theory of Mind for robots.

2013–2015 **Post-doctoral fellow**, *CHILI, EPFL, Lausanne, Switzerland*.
Interaction with Robots in Learning Environments – Supervision of the robotic group.

2012–2013 **Post-doctoral fellow**, *LAAS-CNRS, Toulouse, France*.
Spatial and Temporal Reasoning for Cognitive Robotic Architectures.

2008–2012 **Joint German-French PhD in Cognitive Robotics**, *LAAS-CNRS, Toulouse, France / Technical University of Munich, Germany*.
with High Distinction "Summa Cum Laude" – awarded CNRS' **Best PhD in Robotics 2012**
Supervisors: Pr. Rachid Alami, CNRS; Pr. Michael Beetz, TUM.

2006–2007 **Research Engineer**, *INRIA, Paris, France*.
Development of semantic-aware control architectures for autonomous vehicles.

2002–2006 **Joint German-French MSc of Engineering**, *Karlsruhe Institute of Technology / ENSAM ParisTech*.

2004–2005 **MSc Artificial Intelligence for Learning Technologies**, *University Paris V, College of Mathematics and Computer Sciences*, With Honours.

Scientific Impact & Dissemination Activities

Highly respected figure in the Intelligent Robots community, *invited to high-profile editorial roles*.

As of Oct 2019, 70+ publications, *2000+ citations, h-index = 23, i10-index = 38* .

Recent International expert & advisory roles

2019 **Invited Expert in Child-Robot Interaction**, *robot4SEN project, VTC, Hong Kong*.

2019– **Invited member on the EPSRC Associate Peer Review College**.

2019 **Invited PhD dissertation examiner**, *University of Bielfeld, Germany*.

2019 **Invited PhD dissertation examiner**, *University of Örebro, Sweden*.

2018– **Senior Scientific Adviser for South-West SMEs**, *EU H2020 SABRE project*.

2017– **EU H2020 member on the Peer Review College**.

National & International Editorial roles

2019–2020 **Organisation of the IEEE/ACM HRI2020 conference**, *local chair*.

2019– **UK TAROS conference on Autonomous Robotic Systems**, *co-coordinator*.

2018– **Associate Editor**, *Frontiers in Robotics and AI*.

2016– **Program Committee**, *IEEE/ACM HRI 2016, 2017, 2018, 2019*.

2016– **Associate Editor**, *IEEE IROS 2016, 2017, 2018*.

2018 **Program Committee**, *IJCAI 2017, IJCAI 2018, HAI 2018, AAMAS 2019*.
2017 **alt.HRI chair**, *HRI 2017*.
2016 **Program Chair, Workshop on Cognitive Architectures for Social HRI**, *HRI 2016*.
2013 **Steering Committee, Intl. Workshop on MORSE for HRI**, *HRI 2014*.
2013 **Program Committee, Workshop on Developmental Social Robotics**, *IROS 2013*.
2012 **Steering Committee, Intl. Workshop on MORSE and its Applications**.
2008–2009 **Steering Committee, Cognitive Sciences' Young Researchers Conference 2009**.

Policy shaping

2018–2019 Involved in BRL's strategic discussion about Intelligent Manufacturing; HRI systems; Assistive robotics with **key policy makers** (**BEIS Secretary of State Greg Clark**; **Minister of State for Universities, Science, Research and Innovation Chris Skidmore**; **West of England CA Tim Bowles**; **EPSRC Portfolio manager for Robotics Clara Morri**)

Recent International Keynotes and Invited Talks

- **Robots for Learning** – *invited speaker*, 2019
  Robot4SEN, Vocational Training Council, Kong Kong
- **From Big Data to Social Robotics** – *keynote*, 2019
  UK RAS conference, Loughborough, UK
- **Big Data and Social Robotics** – *invited speaker*, 2018
  LAAS-CNRS, Toulouse, France
- **Child-robot Social Interactions** – *invited speaker*, 2018
  IIT, Genoa, Italy
- **Theory of Mind and Joint-action** – *keynote*, 2018
  Robotics Science and System, Pittsburgh, USA
- **Immersive Technologies for Safe Driverless Vehicles** – *invited speaker*, 2018
  South West Creative Technology Network, Bristol, UK
- **Human-Robot interaction in the context of safe driverless vehicles** – *invited speaker*, 2018
  HRI Symposium, Stanford University, Stanford, USA
- **Robots for Learning** – *keynote*, 2018
  Symposium on Robots for Language Learning, Koç University, Istanbul, Turkey

Awards and Honours

HRI'2017 **Best Paper Award 'Design'**.
HRI'2016 **Best Paper Award 'Methods and Theory'**.
AAAI'2015 **Best Video Award in Artificial Intelligence**.
AAAI'2014 **Best Late Breaking Report Award**.
2012 **Best PhD in Robotics**, *CNRS*.
2012 **PhD with High Distinction**, *("Summa Cum Laude"), TU Munich*.
Ro-Man'2010 **Best Paper Award**.

Publications

As of Sept 2019, 70+ publications, 1900+ citations, h-index = 23, $i10$-index=38 *(Google Scholar)*.
→ *Link to complete list of publications, workshops and seminars*.

International peer-reviewed journals

- Senft, E., Lemaignan, S., Baxter, P., Bartlett, M., Belpaeme, T.
  Teaching robots social autonomy from in situ human guidance
  Science Robotics 2019.
- Wallbridge, C., Lemaignan, S., Senft, E., Belpaeme, T.
  Generating Spatial Referring Expressions in a Social Robot: Dynamic vs Non-Ambiguous
  Frontiers in AI and Robotics 2019.
- Bartlett, M., Edmunds, C. E. R., Belpaeme, T., Thill, S., Lemaignan, S.
  What Can You See? Identifying Cues on Internal States from the Kinematics of Social Interactions
  Frontiers in AI and Robotics 2019.

- Flook, R., Shrinah, A., Wijnen, L., Eder, K., Melhuish, C., Lemaignan, S.
  On the Impact of Different Types of Errors on Trust in Human-Robot Interaction
  Interaction Studies 2019.
- Lemaignan, S., Edmunds E. R., C., Senft, E., Belpaeme, T.
  The PInSoRo dataset: Supporting the data-driven study of child-child and child-robot social dynamics
  PLOS ONE 2018.
- Senft, E., Baxter, P., Kennedy, J., Lemaignan, S., Belpaeme, T.
  Supervised Autonomy for Online Learning in Human-Robot Interaction
  Pattern Recognition Letters 2017.
- Lemaignan, S., Warnier, M., Sisbot, E.A., Clodic, A., Alami, R.
  Artificial Cognition for Social Human-Robot Interaction: An Implementation
  Artificial Intelligence 2017.
- Lemaignan, S., Jacq, A., Hood, D., Garcia, F., Paiva, A., Dillenbourg, P.
  Learning by Teaching a Robot: The Case of Handwriting
  IEEE Robotics and Automation Magazine 2016.
- Dillenbourg, P., Lemaignan, S., Sangin, M., Nova, N., Molinari, G.
  The Symmetry of Partner Modelling
  Intl. J. of Computer-Supported Collaborative Learning 2016.
- Lemaignan, S.
  Grounding the Interaction: Knowledge Management for Interactive Robots
  Künstliche Intelligenz 2013.
- Lallée, S., Pattacini, U., Lemaignan, S., Lenz, A., Melhuish, C., Natale, L., Skachek, S., Hamann, K., Steinwender, J., Sisbot, E.A., Metta, G., Pipe, T., Alami, W., Warnier, M., Guitton, J., Warneken, F., Dominey, P.F.
  Towards a Platform-Independent Cooperative Human-Robot Interaction System: III. An Architecture for Learning and Executing Actions and Shared Plans
  IEEE Transactions on Autonomous Mental Development 2012.
- Lemaignan, S., Ros, R., Sisbot, E. A., Alami, R., Beetz M.
  Grounding the Interaction: Anchoring Situated Discourse in Everyday Human-Robot Interaction
  International Journal of Social Robotics 2011.

International peer-reviewed conference articles

- Sallami, Y., Lemaignan, S., Clodic, A., Alami, R.
  Simulation-based physics reasoning for consistent scene estimation in an HRI context
  IEEE IROS 2019.
- Winkle, K., Lemaignan, S., Caleb-Solly, P., Leonards, U., Turton, A., Bremner, P.
  Effective Persuasion Strategies for Socially Assistive Robots
  ACM/IEEE HRI 2019.
- Wallbridge, C., van den Berghe, R., Hernández García, D., Kanero, J., Lemaignan, S., Edmunds, C., Belpaeme, T.
  Using a Robot Peer to Encourage the Production of Spatial Concepts in a Second Language
  HAI 2018.
- Lemaignan, S., Sallami, Y., Wallbridge, C., Clodic, A., Alami, R.
  underworlds: Cascading Situation Assessment for Robots
  IEEE IROS 2018.
- Senft, E., Lemaignan, S., Bartlett, M., Baxter, P., Belpaeme, T.
  Robots in the classroom: Learning to be a Good Tutor
  ACM/IEEE HRI – Workshop R4L 'Robots for Learning' 2018.
- Irfan, B., Kennedy, J., Lemaignan, S., Papadopoulos, F., Senft, E., Belpaeme, T.
  Social psychology and Human-Robot Interaction: an Uneasy Marriage
  alt.HRI 2018.
- Wallbridge, C., Lemaignan, S., Belpaeme, T.
  Qualitative Review of Object Recognition Techniques for Tabletop Manipulation
  HAI 2017.
- Senft, E., Lemaignan, S., Baxter, P., Belpaeme, T.
  Toward Supervised Reinforcement Learning with Partial States for Social HRI
  AAAI Fall Symposium – AI-HRI 2017.
- Özgür, A., Lemaignan, S., Johal, W., Beltran, M., Briod, M., Pereyre, L., Mondada, F., Dillenbourg, P.
  Cellulo: Versatile Handheld Robots for Education
  ACM/IEEE HRI 2017.

- Kennedy, J., Lemaignan, S., Montassier, C., Lavalade, P., Irfan, B., Papadopoulos, F., Senft, E., Belpaeme, T.
  Child Speech Recognition in Human-Robot Interaction: Evaluations and Recommendations
  ACM/IEEE HRI 2017.
- Chandra, S., Alves-Oliveira, P., Lemaignan, S., Sequeira, P., Paiva, A., Dillenbourg, P.
  Children's Peer Assessment and Self-disclosure in the Presence of an Educational Robot
  IEEE Ro-Man 2016.
- Hostettler, L., Özgür, A., Lemaignan, S., Dillenbourg, P., Mondada, F.
  Real-Time High-Accuracy 2D Localization with Structured Patterns
  IEEE ICRA 2016.
- Baxter, P., Kennedy, J., Senft E., Lemaignan, S., Belpaeme, T.
  From Characterising Three Years of HRI to Methodology and Reporting Recommendations
  alt.HRI 2016.
- Lemaignan, S., Garcia, F., Jacq, A., Dillenbourg, P.
  From Real-time Attention Assessment to "With-me-ness" in Human-Robot Interaction
  ACM/IEEE HRI 2016.
- Jacq, A., Lemaignan, S., Garcia, F., Dillenbourg, P., Paiva, A.
  Building Successful Long Child-Robot Interactions in a Learning Context
  ACM/IEEE HRI 2016.
- Baxter, P., Ashurst, E., Kennedy, J., Senft, E., Lemaignan, S., Belpaeme, T.
  The Wider Supportive Role of Social Robots in the Classroom for Teachers
  WONDER Workshop - ICSR 2015.
- Lemaignan, S., Fink, J., Mondada, F., Dillenbourg, P.
  You're Doing It Wrong! Studying Unexpected Behaviors in Child-Robot Interaction
  ICSR 2015.
- Lemaignan, S., Hosseini, A., Dillenbourg, P.
  pyRobots: a Toolset for Robot Executive Control
  IEEE IROS 2015.
- Karim, M. E., Lemaignan, S., Mondada, F.
  A Review: Can Robots Reshape K-12 STEM Education?
  ARSO 2015.
- Chandra, S., Alves-Oliveira, P., Lemaignan, S., Sequeira, P., Paiva, A., Dillenbourg, P.
  Can a Child Feel Responsible for Another in the Presence of a Robot in a Collaborative Learning Activity?
  IEEE Ro-Man 2015.
- Lemaignan, S., Dillenbourg, P.
  Mutual Modelling in Robotics: Inspirations for the Next Steps
  ACM/IEEE HRI 2015.
- Hood, D., Lemaignan, S., Dillenbourg, P.
  When Children Teach a Robot to Write: An Autonomous Teachable Humanoid Which Uses Simulated Handwriting
  ACM/IEEE HRI 2015.
- Fink, J., Rétornaz, P., Vaussard, F., Wille, F., Franinovi, K., Berthoud, A., Lemaignan, S., Dillenbourg, P., Mondada, F.
  Which Robot Behavior Can Motivate Children to Tidy up Their Toys? Design and Evaluation of "Ranger"
  ACM/IEEE HRI 2014.
- Lemaignan, S., Hanheide, M., Karg, M., Khambhaita, H., Kunze, L., Lier, F., Lütkebohle, I., Milliez, G.
  Simulation and HRI - Recent Perspectives with the MORSE Simulator
  SIMPAR 2014.
- Lemaignan, S., Fink, J., Dillenbourg, P., Braboszcz, C.
  The Cognitive Correlates of Anthropomorphism
  Workshop A bridge between Robotics and Neuroscience - HRI 2014.
- Lemaignan, S., Alami, R.
  Explicit Knowledge and the Deliberative Layer: Lessons Learned
  IEEE IROS 2013.
- Echeverria, G., Lemaignan, S., Degroote, A., Lacroix, S., Karg, M., Koch, P., Lesire, C., Stinckwich, S.
  Simulating complex robotic scenarios with MORSE
  SIMPAR 2012.
- Warnier, M., Guitton, J., Lemaignan, S., Alami, R.
  When the Robot Puts Itself in Your Shoes. Managing and Exploiting Human and Robot Beliefs
  IEEE Ro-Man 2012.

- Alami, R., Warnier, M., Guitton, J., Lemaignan, S., Sisbot, E. A.
  When the robot considers the human...
  ISRR 2011.
- Lallée, S., Pattacini, U., Boucher, J.D., Lemaignan, S., Lenz, A., Melhuish, C., Natale, L., Skachek, S., Hamann, K., Steinwender, J., Sisbot, E.A., Metta, G., Alami, R., Warnier, M., Guitton, J., Warneken, F., Dominey, P.F.
  Towards a Platform-Independent Cooperative Human-Robot Interaction System: II. Perception, Execution and Imitation of Goal Directed Actions
  IEEE IROS 2011.
- Lemaignan, S., Ros, R., Alami, R., Beetz, M.
  What are you talking about? Grounding dialogue in a perspective-aware robotic architecture
  IEEE Ro-Man 2011.
- Echeverria, G., Lassabe, N., Degroote, A., Lemaignan, S.
  Modular Open Robots Simulation Engine: MORSE
  IEEE ICRA 2011.
- Lemaignan, S., Ros, R., Mösenlechner, L., Alami, R., Beetz, M.
  ORO, a Knowledge Management Module for Cognitive Architectures in Robotics
  IEEE IROS 2010.
- Ros, R., Lemaignan, S., Sisbot, E. A., Alami, R., Steinwender, J., Hamann, K., Warneken, F.
  Which One? Grounding the Referent Based on Efficient Human-Robot Interaction
  IEEE Ro-Man 2010.
- Lallée, S., Lemaignan, S., Lenz, A., Melhuish, C., Natale, L., Skachek, S., van Der Zant, T., Warneken, F., Dominey, P.F.
  Towards a Platform-Independent Cooperative Human-Robot Interaction System: I. Perception
  IEEE IROS 2010.
- Mallet, A., Pasteur, C., Herrb, M., Lemaignan, S., Ingrand, F.
  GenoM3: Building middleware-independent robotic components
  IEEE ICRA 2010.
- Mehani, O., Benenson, R., Lemaignan, S., Ernst, T.
  Networking Needs and Solutions for Road Vehicles at Imara
  ITST 2007.
- Stinckwich, S., Lemaignan, S., Saidani, S.
  SqueakBot: a Pedagogical Robotic Platform
  C5 Conference 2007.
- Lemaignan, S., Siadat, A., Dantan, J.Y., Semenenko, A.
  MASON: A proposal for an ontology of manufacturing domain
  IEEE Workshop on Distributed Intelligent Systems (DIS) 2006.

Book chapters

- Mondada, F., Fink, J., Lemaignan, S., Mansolino, D., Wille, F., Franinovi, K.
  Ranger, an Example of Integration of Robotics into the Home Ecosystem
  2015.

Selected Fellowships & Grants

2019–2022 **InnovateUK**, *CAV Forth – Verification for Connected Autonomous Vehicles*, Co-Investigator, £600K.

2018–2019 **University of the West of England**, *Robots in Human Environment*, Principal Investigator, £2.5K.

2015–2017 **EU H2020 Marie Skłodowska-Curie Individual Fellowship**, Principal Investigator, € 195K.

Four additional bids under review

Supervision & Teaching Experience

Students supervision, Currently supervising 10+ PhD and MSc students, (click here for full list).

- N. Webb (PhD, 2019-): *Data-Driven Human Robot Interaction*
- L. Wijnen (PhD, 2019-): *Trust in Human Robot Interaction*
- M. Bartlett (PhD, 2017-): *Data-Driven Social Robotics*
- K. Winkle (PhD, 2016-): *Persuasive human-robot interactions*
- C. Wallbridge (PhD, 2016-): *Spatial reasoning for Child-Robot Interaction*
- E. Senft (PhD, 2015-2018): *Shared autonomy for social human-robot interactions*
- A. Jacq (PhD, 2014-2015): *Mutual modeling and repair strategies in HRI*
- A. Özgür (PhD, 2014-2015): *Cellulo: haptic robotics for learning*
- S. Chandra (PhD, 2013-2017): *CoWriter project: learning by teaching handwriting to a robot*
- J. Fink (PhD, 2011-2014): *Long-term acceptance of robots in daily life & anthropomorphism*

2018– **University of the West of England**, *senior lecturer*.
teaching at MSc level; Human-Robot Interaction, data science

2016–2018 **Plymouth University**, *lecturer*.
teaching at BSc & MSc level robotics, including HRI, ROS, Kalman filtering, localisation and planning, control architectures

2018–2016 **Guest lectures & Seminars**, *Plymouth University, EPFL, Université de Toulouse*.
ROS, simulation, ontologies, Python/C++ software engineering, computer graphics & 3D modelling.

2008–2011 **Teaching assistant**, *INSA Toulouse, Écoles des Mines de Paris*.
Prolog, Ontology Modeling, Java, ADA, SQL, Mechatronics.

Selected outreach activities

2019 **Scientific advisor for the WeTheCurious Bristol's science museum**, *City Lab project*.

2016– **UK & EU Robotics Weeks coordinator**, *University of Plymouth, University of the West of England*.

2011 **'Roboscopie' Human-Robot public theater performance**, *Science Day'11*.
`http://bit.ly/1LQpNWA`

2008–2011 **Toulouse's Cognitive Sciences Students Association**, *Co-chair*.

2008–2009 **South African SciFest festival**, *Science facilitator*.

1997–2012 **Executive Committee & Head of Educational Robotics, Planète Sciences**, *including coordination of the EU-ROBOT Robotic Competition* .

Technical Skills and Spoken Languages

Robotics

- Expert in cognitive robotics and human-robot interaction
- Expert in symbolic knowledge representation
- Expert PR2, Pepper, Nao developer
- Contributor to ROS, OpenCV
- Lead dev. MORSE simulator

Programming

- Python, modern C++, Prolog, SmallTalk
- Deep-learning frameworks: pytorch, TensorFlow
- Open-source enthusiast
  GitHub: `github.com/severin-lemaignan`

Languages

French Native

English Fluent

German Advanced