CURRICULUM VITAE

AAMIR AHMAD

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Education

- **Institute for Systems and Robotics, Instituto Superior Técnico, Lisbon, Portugal** —

    – PhD (*with Merit*) in Electrical and Computer Engineering
    – PhD obtained with the *European Doctorate* Certificate
    – **Supervisor:** Prof. Dr. Pedro Manuel Urbano de Almeida Lima
    – **Thesis:** An Integrated Bayesian Approach to Multi-Robot Cooperative Perception
    – **Duration:** January 2010 - April 2013; Graduation Date: April 23, 2013
    – **Members of the Jury (PhD Thesis Committee):**

        * Prof. Dr. Wolfram Burgard
        * Prof. Dr. Mário Alexandre Teles de Figueiredo
        * Prof. Dr. José Alberto Rosado dos Santos Victor
        * Prof. Dr. Pedro Manuel Urbano de Almeida Lima
        * Prof. Dr. Vítor Manuel Ferreira dos Santos

    – **Research Keywords:**

        * Robot Localization, Object Recognition and Tracking.
        * Multi-robot systems and cooperative perception.
        * Active cooperative perception.
        * Bayesian methods for cooperative robot localization and object tracking.
        * Nonlinear optimization techniques for robot localization and object tracking.

- **Indian Institute of Technology (IIT), Kharagpur** —

    – Bachelor of Technology (*with Honours*) in Civil Engineering
    – Thesis: Design and implementation of a six-legged robot and map generation of a cluttered environment using on-board sonar range finder.
    – Course Duration: 8 semesters (July 2004 - July 2008)
    – Graduation Date: July, 2008

Research Experience

- **Max Planck Institute for Biological Cybernetics, Tübingen, Germany**

    – *September 2014 - Current*.
    – Marie Curie Postdoctoral Fellow - **Funded by the European Commission through Intra-European Fellowships for career development (IEF) - Marie Curie Actions 2013**

- **Institute for Systems and Robotics, Instituto Superior Técnico, Lisbon, Portugal**

    - *(March 2013 - August 2014)* Research grantee in the FP7 European project RoCKIn: Robot Competitions Kick Innovation in Cognitive Systems and Robotics (FP7-EU-601012).
    - *(February 2010 - February 2013)* Research grantee in the project PCMMC: PCMMC: Perception-Driven Coordinated Multi-Robot Motion Control (FCT PTDC/EEA-CRO/100692/2008) and worked under the guidance of Prof. Pedro U. Lima towards my PhD thesis.
    - *(January 2009 - January 2010)* Project grantee in the FP6 European project URUS: Ubiquitous Networking Robotics in Urban Settings (FP6-EU-IST-045062). Worked for the development of Linux device drivers for touch screens.
    - *(July 2008 - August 2014)* Researcher and team member in the 'RoboCup Middle Sized League' team 'SocRob'. Participations: National Level: Róbotica (RoboCup Portuguese Open) 2009, 2010, 2011, 2012 and 2013. International Level: RoboCup 2009 (Graz, Austria), RoboCup 2011(Istanbul, Turkey).
    - *(May 2007 - July 2007)* Research intern and team member in the 'RoboCup Middle Sized League' team 'SocRob' from Portugal in RoboCup 2007 held at Georgia Tech, Atlanta.

- **Autonomous Intelligent Systems Research Laboratory, Albert-Ludwigs-University Freiburg, Germany**

    - *(May 11, 2012 - August 10, 2012)* Research intern under the guidance of Prof. Dr. Wolfram Burgard. Worked towards the development of graph optimization-based approach for cooperative robot localization and object tracking.

- **Autonomous Systems Laboratory, R&D unit of Instituto Superior de Engenharia do Porto (ISEP) and the Engineering School of Porto Polytechnic, Oporto, Portugal**

    - *(May 15, 2011 - June 15, 2011)* Research intern under the guidance of Prof. Eduardo Silva. Worked towards 3-D tracking of a known-sized spherical object using a single dioptric camera.

- **Indian Institute of Technology, Kharagpur, India**

    - *(July 2007 - July 2008)* Worked towards the completion of B-Tech thesis titled "Design and implementation of a six-legged robot and map generation of a cluttered environment using on-board sonar range finder".

Projects

- **(Sep 2014 - present)** Lead Researcher of the Marie Curie IEF project TRaVERSE: Towards Very Large Scale Human-Robot Synergy. PIEF-GA-2013-626050.

- **(Mar 2013 - Aug 2014)** European project RoCKIn: Robot Competitions Kick Innovation in Cognitive Systems and Robotics (FP7-EU-601012)

- **(Feb 2010 - Feb 2013)** Portuguese project PCMMC: Perception-Driven Coordinated Multi-Robot Motion Control (FCT PTDC/EEA-CRO/100692/2008)

- **(Jan 2009 - Jan 2010)** European project URUS: Ubiquitous Networking Robotics in Urban Settings (FP6-EU-IST-045062)

Publications

Published Journal Articles

1. **Formation Control Driven by Cooperative Object Tracking.** *Pedro Lima, Aamir Ahmad, André Dias, A. G. S. Conceição, António Paulo Moreira, Eduardo Silva, Luís Almeida , Luís Oliveira, Tiago P. Nascimento* Robotics and Autonomous Systems (RAS) Journal, Vol 63 Issue 1), pp. 68–79. (Available Online: `http://dx.doi.org/10.1016/j.robot.2014.08.018`)

2. **3D to 2D Bijection for Spherical Objects Under Equidistant Fisheye Projection**, *Aamir Ahmad, João Xavier, José Santos-Victor, Pedro Lima*, Elsevier Journal of Computer Vision and Image Understanding (CVIU), Vol. 125 pp. 72–183. (Available Online: `http://dx.doi.org/10.1016/j.cviu.2014.04.004`)

3. **Multi-Robot Cooperative Spherical-Object Tracking in 3D Space Based on Particle Filters**, *Aamir Ahmad and Pedro Lima*, Robotics and Autonomous Systems (RAS) Journal, Vol. 61, Issue 10, October, pp. 1084-1093, ISSN 0921-8890, 2013 (Available Online: `http://dx.doi.org/10.1016/j.robot.2012.12.008`).

Submitted Journal Articles

1. **A Scalable Approach to Multirobot Cooperative Localization and Object Tracking Based on Particle Filters.** *Aamir Ahmad and Pedro Lima* Submitted to: IEEE Transactions on Robotics (T-RO), 2014

Published Book Chapters

1. **Cooperative Localization Based on Visually Shared Objects**, Pedro Lima, P. Santos, R. Oliveira, Aamir Ahmad and J. Santos, *RoboCup 2010: Robot Soccer World Cup XIV*, Springer-Verlag, Berlin, Heidelberg 350-361. Series: Lecture Notes in Computer Science, Vol.6556 Subseries: Lecture Notes in Artificial Intelligence. Editors: Ruiz-del-Solar, Javier; Chown, Eric; Ploeger, Paul G.

2. **Towards Optimal Robot Navigation in Domestic Spaces**, Rodrigo Ventura, Aamir Ahmad, *RoboCup 2014: Robot World Cup XVIII*, Volume 8992 of the series Lecture Notes in Computer Science pp 318-331., Editors: Reinaldo A. C. Bianchi, H. Levent Akin, Subramanian Ramamoorthy, Komei Sugiura.

Published Conference Papers

1. **Moving-horizon Nonlinear Least Squares-based Multirobot Cooperative Perception**, *Aamir Ahmad, Heinrich H. Bülthoff*, 7th European Conference on Mobile Robots (ECMR 2015), Lincoln, United Kingdom.

2. **Onboard robust person detection and tracking for domestic service robots**, *David Sanz, Aamir Ahmad, Pedro Lima*, ROBOT'2015 - Second Iberian Robotics Conference, Lisbon, Portugal

3. **Towards Optimal Robot Navigation in Urban Homes**, *Aamir Ahmad and Rodrigo ventura*, Proc. of the 2014 RoboCup Symposium, João Pessoa, Brazil.

4. **Cooperative Robot Localization and Target Tracking based on Least Square Minimization**, *Aamir Ahmad, Gian Diego Tipaldi, Pedro Lima and Wolfram Burgard*, Proc. of the 2013 IEEE International Conference on Robotics and Automation (ICRA 2013), Karlsruhe, Germany

5. **Perception-Driven Multi-Robot Formation Control**, *Aamir Ahmad, Tiago Nascimento, André G. S. Conceição, Antonio Paulo Moreira and Pedro Lima*, Proc. of the 2013 IEEE International Conference on Robotics and Automation (ICRA 2013), Karlsruhe, Germany

6. **Unknown-Color Spherical Object Detection and Tracking**, *A. Troppan, E. Guerreiro, F. Celiberti, G. Santos, Aamir Ahmad and Pedro Lima*, in Proceedings of Robotica 2013 - 13th International Conference on Autonomous Robot Systems and Competitions, Lisbon, Portugal, 2013

7. **Multi-Robot Cooperative Object Tracking Based on Particle Filters** , *Aamir Ahmad and Pedro Lima*, Proc. of European Conference on Mobile Robots, Örebro, Sweden, 2011
   → Voted by the reviewers and the conference participants as one of the best papers presented.

8. **Cooperative Localization Based on Visually Shared Objects**, *Pedro Lima, P. Santos, R. Oliveira, Aamir Ahmad and J. Santos*, Proc. of RoboCup 2010 Symposium, Singapore, 2010

9. **Background Subtraction Based on Rank Constraint for Point Trajectories**, *Aamir Ahmad, Alessio Del Bue and Pedro Lima*, Proc. of RecPad 2009 - 15th Portuguese Conference on Pattern Recognition, Aveiro, Portugal, 2009

10. **Probabilistic Roadmap Method and Real Time Gait Changing Technique Implementation for Travel Time Optimization on a Designed Six-legged Robot**, *Aamir Ahmad and Nirjhar Dhang*, Proc. of ISR 2008 - 39th International Symposium on Robotics, Seoul, South Korea, 2008

Published Technical Reports

1. Messias, J., **Ahmad, A.**, Reis, J., Serafim, M., Lima, P. (2013): SocRob-MSL 2013 Team Description Paper. Middle Sized League in RoboCup 2013, Eindhoven, The Netherlands.

2. Messias, J., **Ahmad, A.**, Reis, J., Grego, F., Sousa, J., Lima, P. (2011): ISocRob-MSL 2011 Team Description Paper. Middle Sized League in RoboCup 2011, Istanbul, Turkey.

3. Lima, P., Messias, J., Santos, J., Estilita, J., Barbosa, M., **Ahmad, A.**, Carreira, J. (2009): ISocRob-MSL 2009 Team Description Paper. Middle Sized League in RoboCup 2009, Graz, Austria.

Other Scientific Activities

- **Member of the Institute for Systems and Robotics (ISR) Scientific Board at Instituto Superior Técnico, Lisbon.**

- **Elected as a Member of the Organizing Committee**, Middle Size League, RoboCup 2014, João Pessoa, Brazil.

- **Member of the Program Committee**, International Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2016 and 2014

- **Member of the Program Committee**, European Conference on Mobile Robots (ECMR) 2013, Barcelona, Spain.

- **RP (Responsible Person) for RoboCup Challenge at India 2009 and 2010**.

- **Governor, Technology Robotics Society (TRS) at IIT Kharagpur, India** (*July 2007 to April 2008*)

Awards, Recognition and Grants

- My research project proposal TRaVERSE was successfully evaluated for the Marie Curie Intra-European Fellowship ($\sim$10% acceptance rate) in 2013.

- My publication **Multi-Robot Cooperative Object Tracking Based on Particle Filters** was selected as one of the best papers in the European Conference on Mobile Robots (ECMR) 2011, Örebro, Sweden. It was invited to be published in a special issue of Robotics and Autonomous Systems (RAS) journal.

- Research grantee fellowship in the project RoCKIn. Funding Agency: FP7-EU-601012. Duration: March 2013 - present.

- RoboCup MSL team 'ISocRob' finished as runner-up in Róbotica 2011, the Portuguese national open for robotics competitions.

- Research Grantee Fellowship in the project PCMMC. Funding Agency: FCT PTDC/EEA-CRO/100692/2008. Duration: 2010-2013.

- Research Grantee Fellowship in the project URUS. Funding Agency: FP6-EU-IST-045062. Duration: 2009.

- Intern Scholarship at ISR, IST, Lisboa. Funding Agency: N14/ESA Financial code: IST/ISR No 1601. Duration: 2008