



Curriculum Vitae  
for  
Dr. Henrik Iskov Christensen

## I. PERSONAL DATA

Name:

Henrik Iskov Christensen,  
Born: Frederikshavn, Denmark

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San Diego, CA 92103  
Phone: +1 858 260 0570  
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Affiliation:

Institute for Contextual Robotics  
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Citizenship:

USA (Naturalized Dane)

### Professional interests:

A *systems* oriented approach to Machine Perception, Robotics, and Design of Intelligent Machines.

## II. EDUCATIONAL BACKGROUND

1989

Ph.D., Faculty of Technical Sciences, Aalborg University, DK.  
Major subjects: Motion Analysis, Multi Scale Image Representation of Space and Time, and Concurrent computing.  
Dissertation: "Aspects of Real Time Image Sequence Analysis".  
Supervisor: Prof. Erik Granum.

1987

M.Sc. EE (summa cum laude), Institute of Electronic Systems, Aalborg University, DK  
Major subjects: Process Control and Image Analysis  
Thesis: "Monitoring Moving Objects in Real-Time"

1981                      Technical Assistant – Mechanical Engineering, Cert. of Apprenticeship (with honors), Frederikshavn Technical School, Denmark.

### III. EMPLOYMENT

#### Professional Experience:

Feb 2019 –              Co-founder of Robust.AI, Palo Alto, CA

Jul 2017 –              Qualcomm Chancellor's Chair in Robot Systems, UC San Diego.

Aug 2016 –              Director Institute for Contextual Robotics, UC San Diego. The Institute studies robot systems in the context of its actual use-cases and real-time perceptual information to provide holistic and robust solutions. The Institute includes four departments across Engineering and Social Sciences.

Aug 2016 –              Professor of Computer Science, Dept. of Computer Science and Engineering, UC San Diego, California, USA.

Oct 2016 –Jul 2018    Member Board of Director, Blue Ocean Robotics Ltd, Odense, Denmark.

Feb 2014 – 2016       Advisor to the Manufacturing Academy of Denmark (MADE) with particular emphasis on strategy and impact. MADE is a joint venture between Danish Production Companies, The Council for Strategic Research and 4 Danish Universities.

Jan 2014 – Sep 2016   Board of Directors, "Universal Robots Inc". New York, NY. The US subsidiary of Universal Robots, Odense, DK

Oct 2013 –Jul 2016    Founding Executive Director, "Institute for Robotics and Intelligent Machines", Georgia Institute of Technology - IRIM - a unit that involves more than 60 faculty and 150 graduate students doing research, education and translation of robotics across manufacturing, services, healthcare and defense applications.

Sep 2013 –              Co-Founder and Strategic Advisor to "Robo-Global" a benchmark index to track the global robotics and automation market. Chairman of AI Strategy and general robotics advisor. Robo-Stox, is an exchange traded fund (ETF) on NYSE with the ticker symbol ROBO. A parallel fund was launched at London Stock Exchange 2014. The international company was renamed Robo-Global from Robo-Stox January 2016.

June 2013 –              Co-founder/Partner of the company "Christensen Consulting Group", providing services to government agencies.

May 2012–2014        Co-founder/Partner of the company The "OR Standard" - a company that optimizes workflow for hospital operating suites. Initially, seeded through the GT Flashpoint Program.

Aug 2009–2017        Adjunct Professor of Electrical and Computer Engineering, College of Engineering, Georgia Institute of Technology.

Aug 2006–Oct 2013    Director Georgia Tech Center for Robotics and Intelligent Machines (RIM@GT), an inter-departmental research center involving College of Computing, College of Engineering, and GTRI.

Feb 2006 –Aug 2016   Professor of Computer Science/Kuka Chair of Robotics – Georgia Institute of Technology, Atlanta, GA, USA. Part time during 2006 and full time from January 2007

July 1998–Dec 2006   Chaired Professor of Computer Science, Dept. of Numerical Analysis and Computer Science, Royal Institute of Technology, Stockholm, Sweden. On part-time leave during 2006

Sept. 1996–July 2006   Scientific Director for "Center for Autonomous Systems", Kungliga Tekniska Högskolan, Stockholm. Sponsored by the Swedish Strategic Research Foundation. Associated with the

Computational Vision and Active Perception group, Dept. for Numerical Analysis and Computer Science.

- Jan. 1996–July 1996 Visiting Professor of Computer and Information Science. GRASP Laboratory, University of Pennsylvania. Doing research on non-linear dynamical systems for control of autonomous sensor-driven agents and intelligent control for multi-agent systems.
- Apr. 1992–Aug. 1998 Associate professor specializing in robot and computer vision, Faculty of Technical Sciences, Aalborg University. Project manager for internationally funded research projects.
- June 1992–Sept. 1995 Local manager for the ESPRIT Basic Research project “Vision as Process-II”. Principal investigator wrt. control of perception.
- Jan. 1990–Dec. 1993 Chairman of the National Vision Programmers Workbench (VIPWOB) group, that developed generic application architectures for image analysis and computer vision.
- Oct. 1989–April 1992 Research Associate and project head at Laboratory of Image Analysis. Project: ESPRIT Basic Research Action BR3038-VAP, “Vision as Process”. The project was a collaboration with five other European Universities. Primary topic for AUC work was perceptual control for dynamic vision systems.
- July 1988–Jan. 1989 Pre-doctoral Fellow at the Advanced Computing and Integrated Sensor Systems Group, Oak Ridge National Laboratory, Tennessee, USA. Participating in the research programme “Robotics and Intelligent Systems Program” (RISP). Primary topics were concurrent computer vision, sensor fusion for mobile robots, and multi resolution methods for dynamic scene analysis. Sponsored by the Danish Technical Research Council, The Danish Research Academy, the Foundation Vision North, and U.S. Department of Energy, under contract DE-AC05-84OR214.
- July 1987–Sept. 1989 Research assistant (Ph.D. student) sponsored by project “Computer Vision, - methods for real-time image sequence analysis”. Supported by FTU grant no. 5.17.5.6.06 from the Danish Technical Research Council.
- 1986–1987 Part time programmer & Teaching Assistant, Image Analysis Group, Aalborg University, DK.
- 1980 Trainee as “Technical Assistant”, Department of Automation, B&W/MAN Alpha Diesel A/S, Frederikshavn, DK.

## Consulting Experience:

### Industrial Consultant:

- OnRobot - Advisor - Board Member (2018–2019)
- Covariant.AI - Advisory Board (2018–2019)
- Ready Robotics - Chair of Advisory Board (2017–2019)
- Tech Mahindra - Manufacturing Advisory Board (2015–2018)
- General Electric - Robotics Advisory Board (2015–2016)
- The Boeing Company - Strategic Automation Roadmap (2015)
- DARPA DRC Impact Study & Student Contest (2013–2015)
- CLSA - Robotics & Automation (2014–2016)
- Symbolic (2014)
- MAG-IAS Composites Board (2010–2013)
- C&S WholeSale (2010–2011)
- Scientific Advisor to Evolution Robotics (1998–2012)
- Member of International Advisory Committee, Instituto Robotica e Systemas, Lisboa, Portugal, (1998–2008)
- iRobot (2004–2006)
- ABB (2001–2005)

Totoya Motor Company (2000–2004)  
Member of the European Image Understanding Environment Design Committee, (1994–1997)  
Registered consultant for Apple Computers Inc. (DK, 1989–1995)  
Development of a system for automatic real time obstacle detection at rail road crossings (DSB, 1988)

## IV. TEACHING

### Ph.D supervision - Ongoing

1. “Autonomous Micro-Mobility”, David Paz, ECE @ UCSD (2023)
2. “ML for Autonomy”, Quan Voun, CS @ UCSD (2023)
3. “Affordance based manipulation”, Andrea Frank, CSE @ UCSD (2022)
4. “Object Based Mapping”, Anwesha Pal, CS @ UCSD (2022)
5. “Social Autonomy for Service Robots”, Priyam Parashar, CS @ UCSD (2021)
6. “Robotics Software Engineering”, Ruffin White, CS @ UCSD (2020)
7. “Robust Autonomy”, Shengye Wang, CS @ UCSD (2020)
8. “Affordance based planning for manipulation”, Andrew Price, Robotics @ GT (2020 - Joint with S. Balakirsky)

### Ph.D supervision - Completed

1. “Multi-Robot Navigation and Mapping”, Carlos Nieto, ECE @ UCSD (2020)
2. “Object-based SLAM”, Siddharth Choudhary, Robotics @ GT (2017)
3. “Grasp Planning”, Ana Huaman, Robotics @ GT (2016)
4. “Planning in Constraint Space for Multi-body Manipulation Tasks”, Can Erdogan, Robotics @ GT (2016)
5. “Navigation Behavior Design and Representations For a People Aware Mobile Robot System”, Akansel Cosgun, Robotics @ GT (2016)
6. “Model Based SLAM”, Alexander Trevor, Robotics @ GT (2015)
7. “Autonomous environment manipulation to facilitate task completion”, Martin Levihn, Robotics @ GT (2015)
8. “Time-Optimal sampling-based motion planning for manipulators with acceleration limits”, Tobias Kunz, Robotics @ GT (2015)
9. “Multi-Modal Object Tracking”, Changhyun Choi, Robotics @ GT (Aug 2014)
10. “Knowledge Transfer in Robot Manipulation Tasks”, Jake Huckaby, Robotics @ GT (Mar 2014)
11. “Trust and reputation in dynamic, heterogenous multi-agent teams”, Charles Pippin, CS @ GT (Oct 2013)
12. “Life-long Mapping and Exploration with a Mobile Robot”, John Rogers III, Robotics @ GT (2012)
13. “HRI for Domestic Robots”, Ja-Young Sung, HCC @ GT (2011) (Co-advisor w. Beki Grinter)

14. “High Performance Manipulation”, Christian Smith - CS @ KTH (Dec. 2009)
15. “Semantic SLAM”, Elin-Anna Topp CS @ KTH (Lic. Oct 2006, Oct 2008)
16. “Deployment of Field Robots in Hazardous Environments”, Carl Lundberg, CS @ KTH (Dec 2007)
17. “Evolutionary Learning for CyberRodents”, Stefan Elfving. CS @ KTH (Nov 2007)
18. “Information Fusion”, Ronnie Johansson, CS @ KTH (Lic. - Dec. 2003, Apr. 2006)
19. “Large Scale SLAM”, John Folkesson, CS @ KTH (Oct 2005)
20. “Architectures for Autonomous Systems”, Anders Orebäck, CS @ KTH (Dec. 2004)
21. “Attention Systems”, Ola Ramström, CS @ KTH (Lic. Nov 2004)
22. “Learning in Behavior Based Systems”, Philipp Althaus, CS @ KTH (November 2003)
23. “Structure from Motion”, Marco Zucchelli, CS @ KTH (June 2002)
24. “A Framework for Integration of Processes”, Lars Petersson, CS @ KTH (Mar 2002)
25. “Sensor Fusion for Navigation”, Guido Zunino, CS @ KTH (Lic. Feb 2002)
26. “Visual Servoing for Manipulation: Robustness and Integration Issues”, Danica Kragic, CS @ KTH (June 2001)
27. “Approaches to Mobile Robot Localisation in Indoor Environments”, Patric Jensfelt EE @ KTH (June 2001)
28. “Sonar Based World Modelling”, Olle Wijk. EE @ KTH (April 2001)
29. “Towards Human-Robot Interaction”, Kristian Simsarian, CS @ KTH (Mar. 2000)
30. “Architectures for Autonomous Mobile Robot Navigation”, Paolo Pirjanian, CE @ AUC (April 1998)
31. “Sensor Planning for Mobile Robot Navigation”, Steen Kristensen. EE @ AUC (August 1996)
32. “A Framework for Control of a Camera Head”, Claus S. Andersen, EE @ AUC (March 1996)
33. “View Planning for Quantification of Local Geometry”, Claus Madsen, EE @ AUC (Oct. 1994).

## Courses taught:

1. Introduction to Robotics (CSE276A – 2018, 2019)
2. Mathematics for Robotics (CSE276C – 2018, 2019)
3. Introduction to Robotics (CSE291D – 2018)
4. Mathematics for Robotics (CSE291G – 2018)
5. Pattern Recognition (CSE 291 – 2017)
6. Pattern Recognition (CS7616 – 2016)
7. Introduction to Robotics - Graduate (CS 7785 – 2015)
8. Industrial Robotics (Professional Education Course @ NIST/DLPE – 2012)
9. Software Engineering in Robotics (CS8803 – 2010)
10. Multi Disciplinary Robotics Research (CS8750/8751 – 2009 –2016)
11. Applied Estimation for Robotics (CS8803 – 2009, 2010, 2012, 2013)
12. Introduction to Robotics and Perception (CS3630 – 2008, 2009, 2015)
13. Mobile Manipulation (CS4632B/8803 – 2007, 2008)

14. Freshman Leap - Section Lead (CS1101 – 2007, 2009)
15. Artificial Intelligence – An Introduction (undergraduate, 2004-2005 @ KTH)
16. Behaviour Based Robotics (Graduate, 1998-2004 @ KTH)
17. Autonomous Systems (undergraduate, 2002-2006 @ KTH)
18. Urban Robotics (Industrial - Professional Education, 2002 @ KTH)
19. Autonomous Robots (Industrial - Professional Education, 2000 @ KTH)
20. Mobile Robotics (Graduate, 1996-1999 @ KTH)
21. Computer Vision Techniques and Projective Geometry (Graduate, 1994-1996 @ KTH)
22. Discrete Mathematics (Graduate, 1993-1996 @ AUC)
23. Expert Systems (Graduate, 1993-1996 @ AUC)
24. Analysis and Design of Algorithms and Data-structures (Undergraduate, 1995 @ AUC)
25. Expert System Technology (Industrial - Professional Education, 1994 @ AUC)
26. Biological Vision (Graduate, 1993 @ AUC)
27. Structured programming (Undergraduate, 1992 @ AUC)
28. C-programming (Undergraduate, 1991 @ AUC)
29. Motion Analysis (Graduate, 1990 @ AUC)

- Other Teaching Activities
- Chair of committee for Masters of Robotics, Engineering, UC San Diego (2019–)
  - Chair of Robotics Specialization - Computer Science, UC San Diego (2017–)
  - Supervised or Co-supervised many (>100) M.Sc. level projects, many basic and advanced B.Sc. projects (>60) in Electronic Engineering, Computer Engineering and Computer Science.
  - Chairman – Engineering of Computer Based Systems education at KTH (adopted- Spring 2000).
  - Chairman of committee for specification of new B.Sc. Electrical and Electronic Engineering curriculum at the Faculty of Science and Technology, Aalborg University. The new curriculum was implemented from July 1996.
  - Designed and implemented a B.Sc. specialization in E.E. entitled “Industrial Computer Engineering”, Aalborg University, in 1994. The specialization was successfully implemented on a trial basis (June 1994–July 1996).
  - Coordinator of E.E. Specialization in Computer Engineering (June 1993–December 1995)

## V. SCHOLARLY ACCOMPLISHMENTS

### Publications

#### Books

- [1] H. I. Christensen and O. Khatib, eds., *Robotics Research*, vol. 100 of *STAR*. Heidelberg/New York: Springer Verlag, Dec 2015.
- [2] H. I. Christensen, F. Groen, and E. Petreu, eds., *International Symposium on Intelligent Autonomous Systems – IAS-11*. Ottawa, Canada: IOS Press, Aug 2010.
- [3] H. I. Christensen, G. Kruijff, and J. Wyatt, eds., *Cognitive Systems*. COSMOS, Berlin, DE: Springer Verlag, May 2010.
- [4] H. I. Christensen and H.-H. Nagel, eds., *Cognitive Vision - Sampling the Spectrum*. No. 3948 in *Lecture Notes in Computer Science*, Heidelberg: Springer Verlag, Apr. 2006.

- [5] H. I. Christensen, ed., *European Robot Symposium – 2006*, vol. 22 of *STAR*. Heidelberg, DE: Springer Verlag, Mar. 2006.
  - [6] A. Bicchi, H. Christensen, and D. Prattichizzo, eds., *Control Problems in Robotics*, vol. 4 of *STAR, Springer Tracts in Advanced Robotics*. Berlin Heidelberg: Springer Verlag, 2002.
  - [7] G. Hager and H. I. Christensen, eds., *Mobile Robot Programming Paradigms*. ICRA-02 Workshop, Washington, DC: IEEE, May 2002.
  - [8] H. I. Christensen and J. Phillips, eds., *Empirical Evaluation of Computer Vision Methods – 2001*. Kauai, HI – USA: IEEE CS Press, Dec. 2001.
  - [9] H. I. Christensen, H. Bunke, and H. Noltemeier, eds., *Intelligent Sensor Based Robotics*, vol. 1724 of *Lecture Notes in Artificial Intelligence*. Heidelberg, Germany: Springer Verlag, Dec. 1999.
  - [10] H. I. Christensen, ed., *Computer Vision Systems*, vol. 1542 of *Lecture Notes in Computer Science*. Heidelberg: Springer Verlag, Jan. 1999.
  - [11] H. Christensen, C. Bautigam, and C. Ridderström, eds., *5th Symposium on Intelligent Robotics Systems*. Stockholm: KTH, July 1997.
  - [12] H. Christensen, W. Forstner, and C. Madsen, eds., *Proceedings: ECVnet Workshop on Performance Characteristics of Computer Vision Algorithms*. Cambridge, UK: AUCPress, Apr. 1996.
  - [13] J. L. Crowley and H. I. Christensen, eds., *Vision as Process*. EEC Basic Research Series, Springer Verlag, Jan. 1995.
  - [14] H. I. Christensen and J. L. Crowley, eds., *Experimental Environments in Computer Vision and Image Analysis*, vol. Vol 11 of *Series in Machine Perception and Artificial Intelligence*. World Scientific Press, Feb. 1994.
  - [15] H. I. Christensen, K. W. Bowyer, and H. Bunke, eds., *Active Robot Vision: Camera Heads, Model Based Navigation and Reactive Control*, vol. 7. World Scientific Publishers, Feb. 1993.
  - [16] H. I. Christensen, ed., *Proceedings Nordic Summer School on Active Vision and Geometric Modeling*. Aalborg, Denmark: AUC Press, Sept. 1992.
- Book Chapters
- [17] B. Dieber, R. White, S. Taurer, B. Breiling, G. Caiazza, H. Christensen, and A. Cortesi, “Penetration testing ros,” in *Robot Operating System (ROS)*, pp. 183–225, Springer, 2020.
  - [18] M. Dogar, R. A. Knepper, A. Spielberg, C. Choi, H. I. Christensen, and D. Rus, “Towards coordinated precision assembly with robot teams,” in *Experimental Robotics, STAR*, pp. 655–669, Springer Verlag, 2016.
  - [19] N. Dantam., A. H. B, H. Christensen, and M. Stilman, “Online camera registration for robot manipulation,” in *Experimental Robotics, STAR*, pp. 179–194, Springer Verlag, 2016.
  - [20] C. Nieto-Granda, A. J. Trevor, J. G. Rogers, A. Cunningham, M. Paluri, N. Michael, F. Dellaert, H. I. Christensen, and V. Kumar, “Effects of sensory precision on mobile robot localization and mapping,” in *Experimental Robotics, STAR*, pp. 433–446, Heidelberg/New York: Springer Verlag, Jan 2014.
  - [21] H. I. Christensen and G. Hager, “Sensing and estimation,” in *Handbook of Robotics* (B. Siciliano and O. Khatib, eds.), ch. 4, Berlin Heidelberg New York: Springer Verlag, May 2008.

- [22] A. Miller and H. Christensen, "Implementation of multi-rigid-body dynamics within a robotic grasping simulator," in *Intl Conf on Robotics and Automation*, Taipei, Taiwan: IEEE, Sept. 2003.
- [23] H. I. Christensen and D. Kragic, "Adaptive hand-eye coordination," in *Skilled Hand Motion* (H. Forsberg, ed.), pp. 10–14, KI, Stockholm: Nobel Foundation, June 2003.
- [24] D. Kragic and H. Christensen, "A framework for visual servoing," in *ICVS-03* (M. Vincze and J. Crowley, eds.), vol. 2626 of *LNCS*, Springer Verlag, Mar. 2003.
- [25] H. I. Christensen, "Intelligent home appliances," in *Robotics Research* (R. A. Jarvis and A. Zelinsky, eds.), no. 6 in Springer Tracts in Advanced Robotics (STAR), pp. 319–330, Heidelberg, DE: Springer Verlag, Jan. 2003.
- [26] H. I. Christensen and J.-O. Eklundh, "Artificial intelligence: Machine vision," in *Van Norstrand's Scientific Encyclopedia* (G. D. Considine, ed.), vol. 1, pp. 258–262, New York, NY: Wiley Interscience, Jan. 2003.
- [27] O. Ramström and H. I. Christensen, "Attention using game theory," in *BMCV-2002*, vol. 2525 of *LNCS*, Heidelberg: Springer Verlag, Nov. 2002.
- [28] D. Kragic and H. Christensen, "Visual servoing meets the real world," in *Visual Servoing*, Lausanne: IEEE, Oct. 2002.
- [29] P. Jensfelt, H. Christensen, and G. Zunino, "Integrated systems for mapping and localization," in *ICRA-02 SLAM Workshop* (J. Leonard and H. Durrant-Whyte, eds.), IEEE, May 2002.
- [30] H. Christensen and J. Eklundh, "Active vision from multiple cues," in *Biologically Motivated Computer Vision – BMCV 2000*, vol. 1811 of *Lecture Notes in Computer Science*, pp. 209–216, Seoul, South Korea: Springer Verlag, May 2000. (keynote).
- [31] D. Kragić and H. I. Christensen, "Active visual tracking of an end-effector: Integration of various cues," in *Robust vision for vision-based control of motion* (M. Vincze and G. Hager, eds.), SPIE/IEEE Series on Imaging Science and Engineering, ch. 1, pp. 1–14, New York, Ny – USA: IEEE Press, Jan. 2000.
- [32] M. Andersson, A. Orebäck, M. Lindström, and H. Christensen, *Intelligent Sensor Based Robots*, vol. 1724 of *Lecture Notes in Artificial Intelligence*, ch. ISR: An Intelligent Service Robot, pp. 291–314. Heidelberg: Springer Verlag, Oct. 1999.
- [33] H. Christensen, L. Petersson, and M. Eriksson, "Mobile manipulation: Getting a grip?," in *ISRR-99* (J. Hollerbach and D. Koditschek, eds.), Heidelberg: Springer Verlag, Oct. 1999.
- [34] E. Large, H. I. Christensen, and R. Bajcsy, "Dynamic robot planning," in *Environmental Modeling* (R. Bolles, H. Bunke, and H. Noldemeyer, eds.), pp. 39–58, Singapore: World Scientific Press, Sept. 1997.
- [35] R. Bajcsy, H. Christensen, and J. Kosecka, *Advanced in Computer Vision*, ch. Segmentation of behavioural spaces for navigation tasks, pp. 241–250. Advanced in Computer Science, Wien: MIT Press, Mar. 1997.
- [36] J. Faymann, E. Rivlin, and H. I. Christensen, "A system for active vision driven robotics," in *Proceedings from The IEEE International Conference on Robotics and Automation*, Minneapolis., IEEE CS Society, Apr. 1996.
- [37] H. I. Christensen, E. Granum, and J. L. Crowley, *System Integration and Control*, pp. 9–22. EEC Basic Research Series, Heidelberg.: Springer Verlag, 1995.
- [38] N. O. Kirkeby and H. I. Christensen, *A Vision Programmers Workbench*, pp. 57–71. Heidelberg: Springer Verlag, 1995.



- [39] C. B. Madsen and H. I. Christensen, *Modelling and testing the stability of edge segments: Length and orientation*, ch. Chapter 1., pp. 1–15. Singapore: World Scientific Press, 1995.
- [40] H. I. Christensen and E. Granum, “Control of perception,” in *Vision as Process* (J. L. Crowley and H. I. Christensen, eds.), EEC Basic Research Series, pp. 323–346, Springer Verlag, Jan. 1995.
- [41] P. Pirjanian and H. I. Christensen, “Hierarchical control for navigation using heterogeneous models,” in *Modelling and Planning for Sensor Based Intelligent Robot Systems* (H. Bunke, T. Kanade, and H. Noldemeier, eds.), vol. Vol 21 of *Series in Machine Perception and Artificial Intelligence*, pp. 344–361, Singapore: World Scientific Press, Nov. 1995. Proc. from Schloss Dagstuhl meeting on Environmental Modelling.
- [42] S. Andreasen and H. I. Christensen, *Image and Signal Processing - Synopsis*, pp. 263–265. Year Book of Medical Informatics - 1994, Schattauer, 1994.
- [43] J. Matas, H. I. Christensen, J. Kittler, J. Illingworth, and L. Nguyen, *Constraining Visual Expectations Using a Grammar of Scene Events*, ch. 1, pp. 1–12. Bratislava: World Scientific, July 1994.
- [44] J. L. Crowley and H. I. Christensen, *Vision as Process: Integration and Control of a Real Time Active Vision System*, pp. 127–155. Series in Machine Perception and Artificial Intelligence, Singapore: World Scientific, Mar. 1994.
- [45] N. O. S. Kirkeby and H. I. Christensen, *The Vision Programmers Workbench (VIPWOB)*, vol. Vol 11 of *Series in Machine Perception and Artificial Intelligence*, pp. 195–224. Singapore: World Scientific, Mar. 1994.
- [46] H. I. Christensen, N. O. Kirkeby, S. Kristensen, and L. F. Knudsen, “Active vision for robot navigation,” in *Proceedings from IRS’93, Zakopane, Poland*, pp. 44–56, Polish Academy of Science, July 1993.
- [47] D. W. Eggert, K. W. Bowyer, C. R. Dyer, H. I. Christensen, and D. B. Goldgof, “Applying the scale space concept to perspective projection aspect graphs,” in *Theory and Applications of Image Analysis - Selected Papers from 7th Scandinavian Conference on Image Analysis*. (P. Johansen and S. I. Olsen, eds.), pp. 48–62., World Scientific Publishers, 1992.
- [48] E. Granum and H. I. Christensen, “Dynamic robot vision,” in *Traditional and Non-Traditional Robotic Sensors*. (T. Henderson, ed.), vol. 63 of *NATO ASI Series F*, pp. 57–71, Springer Verlag, Mar. 1990.
- [49] H. I. Christensen and E. Granum, *On Token-Matching in Real-Time Motion Analysis*, vol. 301 of *LNCS*, pp. 448–457. Heidelberg: Springer Verlag, Mar. 1988.

- Edited Journal Issues
- [50] R. Chatila, H. I. Christensen, and O. Khatib, “Roboitics research - isrr 2011,” *Intl. Jour. of Robotics Research*, vol. 31, pp. 1217–1218, Sep 2012.
  - [51] R. Rusu, G. Gradski, K. Konolige, M. Beetz, and H. I. Christensen, “Special issue on semantic perception for robots in indoor environments,” *Intl. Jour. of Robotics Research*, vol. 30, pp. 1207–1208, Sep 2011.
  - [52] D. Kragic and H. I. Christensen, “Advances in robot vision,” *Robotics and Autonomous Systems*, pp. 1–4, June 2005.
  - [53] H. I. Christensen, “Cognitive vision,” *AI Magazine*, vol. 25, pp. 8–9, July 2004.
  - [54] H. Christensen and P. Corke, “Visual servoing – editorial,” *Intl. Jour. of Robotics Research*, vol. 22, Oct. 2003.
  - [55] H. Christensen and J. Crowley, “Intelligent robotic systems,” *Robotics and Autonomous Systems*, vol. 23, pp. 201–204, Aug. 1998.

## Ref. Jour. Papers

- [56] H. I. Christensen and W. Förstner, "Performance characteristics of vision algorithms," *Machine Vision and Applications*, vol. 9, pp. 215–218, Mar. 1997.
- [57] G.-Z. Yang, B. Nelson, R. Murphy, H. Christensen, S. Collins, P. Dario, K. Goldberg, K. Ikuta, N. Jacobstein, D. Kragic, R. Taylor, and M. McNutt, "Combating covid-19 – the role of robotics in managing public health and infectious diseases," *Science Robotics*, March 2020. (Editorial).
- [58] G.-Z. Yang, R. J. Full, N. Jacobstein, P. Fischer, J. Bellingham, H. Choset, H. Christensen, P. Dario, B. J. Nelson, and R. Taylor, "Ten technologies of the year," *Science Robotics*, vol. 4, 2019.
- [59] P. Parashar, A. Goel, B. Sheneman, and H. I. Christensen, "Towards lifelong adaptive agents: Using meta- reasoning for combining task planning and situated learning," *The Knowledge Engineering Review*, vol. 33, Oct 2018.
- [60] A. Price, S. Balakirsky, and H. Christensen, "Robust grasp preimages under unknown mass and friction distributions," *Integrated Computer Aided Engineering*, vol. 25, pp. 99–110, Mar 2018.
- [61] A. Cosgun and H. I. Christensen, "Context aware robot navigation using interactively built semantic maps," *Paladyn. Journal of Behavioral Robotics*, vol. 9, no. 1, pp. 254–276, 2018.
- [62] F. Berman, R. A. Rutenbar, B. Hailpern, H. Christensen, S. Davidson, D. Estrin, M. Franklin, M. Martonosi, P. Raghavan, V. Stodden, and A. S. Szalay, "Realizing the potential of data science," *Communications of the ACM*, vol. 61, pp. 67–72, Apr 2018.
- [63] S. Choudhary, L. Carlone, C. Nieto, J. Rogers, H. I. Christensen, and F. Dellaert, "Distributed mapping with privacy and communication constraints: Lightweight algorithms and object-based models," *The International Journal of Robotics Research*, vol. 36, no. 12, pp. 1286–1311, 2017.
- [64] H. I. Christensen, A. Khan, S. Pokutta, and P. Tetali, "Approximation and online algorithms for multidimensional bin packing: A survey," *Computer Science Review*, pp. –, 2017.
- [65] C. Choi and H. I. Christensen, "Rgb-d object pose estimation in unstructured environments," *Robotics and Autonomous Systems*, vol. 75, pp. 595–613, January 2016.
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- Theses
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- Reports
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**Keynote / Plenary Presentations**

1. "Impact of AI Research", *Congressional Briefing*, Washington DC, December 2019
2. "Autonomous Driving Vehicles", *AAA Summit*, San Diego, November 2019
3. "Robotics and AI", *Collaborative Robotics, AI and Vision*, San Jose, November 2019
4. "A Perspective on Robotics", General Electric Leadership Summit, New York, October 2019
5. "Human-Robot Collaboration", ISRR, Hanoi, October 2019
6. "A Perspective on AI", Danish Innovation Fund, September 2019
7. "Exploration and mapping by mixed human-robot teams", *IEEE Intl. Symp. on Safety, Security and Rescue Robotics*, Wurzburg, Sept. 2019.
8. "Advances in Robotics", *A.T. Kearney CEO Forum*, Mallorca - Spain, July 2019
9. "A perspective on Robotics", *RSS Pioneer Keynote*, Freiburg, June 2018
10. "What to expect for 2020?", *Robot Summit 2019*, Boston, June 2019
11. "A Perspective on consumer robotics", *Consumer Technology Association*, San Francisco, May 2019
12. "AI for Even Better Robots", *LG Keynote at CES*, Las Vegas, Jan 2019
13. "Robots, Fog and Clouds in a New Economy", *ROS-Industrial 2018*, Stuttgart, Dec 2018
14. "The New Robot Economy", *New York Stock Exchange*, Oct 2018
15. "Multi-Modal Processing for Intelligent Systems", *IEEE Intl. Conf on Multi-Media*, San Diego, CA, Jul 2018
16. "Semantics for Mobile Robots", *IEEE Semantic Computing*, Riverside, CA, Feb 2018
17. "A perspective on service robotics", *ISRR 2017*, Puerto Varas, Chile, Dec 2017
18. "Robotics in China", *US China Commission*, Washington DC, March 2017 (testimony)
19. "Opportunities and Challenges in Robotics", *MARS*, Palm Springs, March 2017
20. "A perspective on robotics", *RoboUniverse*, San Diego, December 2016
21. "A vision for robotics", *CTO Forum*, Half Moon Bay, November 2016
22. "Metrology for the new industry", *Zeiss Forum*, Detroit, November 2016
23. "A perspective on manufacturing", *IEEE Futures Forum*, October 2016
24. "The Future of Everything", *US-Austria Summit*, September, 2016
25. "A Roadmap to the future", *RoboBusiness-2016*, Odense, June 2016
26. "An Overview of Collaborative Robots", *RIA Collaborative Robotics Symposium*, Boston, May 2016
27. "A perspective on robotics", *CUNY Lectures on Design and Technology*, April 2016
28. "Robot Opportunities with a Focus on Asia", *CLSA*, Tokyo, Dec. 2015
29. "Collaborative Robotics - A Perspective", *RIA/Collaborative Robotics Workshop*, Pittsburgh, Oct 2015.
30. "A perspective on robotics", *Carnegie*, Copenhagen, Oct. 2015
31. "Futures of Manufacturing", *ConfigIt Summit*, Georgia, Sep 2015
32. "2D and 3D Vision for Robotics", *ICVS-2015*, Copenhagen, Jul. 2015
33. "Vision based robotics", *BAU Futures of Robotics*, Istanbul, Jun. 2015

34. "Collaborative Robotics", ISR/Automate 2015, Chicago, March 2015
35. "The Future of Fabrication", IEEE *Time Symposium*, San Jose, October 2014
36. "A perspective on collaborative robotics", *RIA Collaborative Robotics*, San Jose, October 2014
37. "Robot Dreaming", *CLSA Asian Forum*, Hong Kong, Sep 2014
38. "The confluence of robotics and automation", *CASE Keynote*, Taipei, August 2014
39. "Collaborative Robotics", *RIA Workshop*, Boston, April 2014
40. "Future opportunities in Robotics", *Economic Forum*, Tokyo, March 2014
41. "Cognitive Robotics", Karles Invitational, *Navy Research Laboratory*, January 2014
42. "A perspective on the future of robotics", *GE Leadership Conference on Robotics*, Albany, Dec 2013.
43. "Design of cooperative robot systems". UT Arlington *Distinguished Engineering Lecture*, Dec. 2013.
44. "Economic driver for robotics", *Robot Business*, St. Monica, Oct. 2013
45. "Robots for Everyone", *TEDxEmory*, Atlanta, April, 2013
46. "Examples of next generation robot systems", 5th Annual IEEE International Conference on Technologies for Practical Robot Applications (TePRA), Boston, April 2013.
47. "The impact of robotics on economic growth", *Automate/ProMAT*, Chicago, IL, Jan 2013.
48. "A perspective on robotics", IROS - International Research Panel, Oct 2012.
49. "Robotics and autonomous cars", *AUVSI Driverless cars symposium*, Detroit, June 2012
50. "Setting an agenda for robotics", Dutch Government Conference, Amsterdam, June 2012.
51. "A vision for robotics", USC Futures of Robotics Symposium, Los Angeles, CA. Dec. 2011
52. "A vision for the future of robotics", Intl. Symposium on Robot Systems, San Francisco, CA, Oct 2011
53. "A Roadmap for Robotics", National Science Foundation, Washington DC, June 2010.
54. "A Vision for US Robotics", Booz Allen Hamilton - Distinguished Lecture, Washington DC, April 2010.
55. "Cognitive systems and a vision for the road ahead", IRT Symposium, Tokyo, May 2010.
56. "A Robotics Roadmap for the Future", AUVSI Annual Meeting, Huntsville, AL, Mar 2010.
57. "A US Roadmap for Robotics", The Netherlands Office for Science and Technology Annual Conference, The Hague, Nov 2009.
58. "Leonardo Da Vinci - Machines & Robots", High Museum of Modern Art, Atlanta, GA, June 11, 2009
59. "Robotics Roadmap: Internet to Robotics", US Congressional Caucus, Washington, DC, May 23, 2009.
60. "Human Augmented Mapping", Franklin Symposium to honor Dr. Ruzena Bajcsy, University of Pennsylvania, Philadelphia, PA. April 2009.
61. "From Internet to Robotics", Schunk Expert Days, Stuttgart, Germany, February, 2009.
62. "Mobile Manipulation Systems", *Intl. Conf on Control and Automation Systems*, Seoul, Korea, October 2008.
63. "Evaluation of Ground Robots for Military Use", *European Land Robot Trial (ELROB)*, Hammelburg, DE, July 2008.

64. "Deployment of Robots for Economic Growth", *International Conference on Advanced Robotics*, Jeju Island, Korea, August 2007.
65. "Vision for Cognitive Systems", *Scandinavian Conference on Image Analysis*, Aalborg, DK, June 2007.
66. "Industrial Applications of Robotics", *RoboBusiness 07*, Boston, MA, May 2007
67. "Personal Robots", *HRI Pioneers*, Washington, DC, March 2007
68. "Semantic Mapping", *Australian Robotics Conference*, December 2006.
69. "Cognitive Systems for Cognitive Assistance", *Australian Artificial Intelligence Conference*, December 2006.
70. "Evaluation of Robots for Human-Robot Interaction", *Performance Metrics for Intelligent Systems Workshop*, NIST, Gaithersburg, August 2006
71. "Robot Vision - Vision or Robotics?", *British Machine Vision Conference*, London, UK, June 2006.
72. "A European Perspective on Robotics", *Intl. Symposium on Robotics*, Tokyo, Dec. 2005.
73. "Personal Robotics", *Artificial Intelligence and Synthesis of Behaviour (AISB)*, Hertsfordshire, UK, April 2005
74. "A Game Theoretical Approach to Information Fusion", *Fusion-04*, Stockholm, June 2004.
75. "Domestic Robot Systems", *Mediterranean Control Conference*, Lisboa, PT, 2002.
76. "Active Vision from Multiple Cues", *Biologically Motivated Computer Vision*, Seoul, Korea, May 2000.
77. "Intelligent Robot Systems", *Intl. Joint Conf. on Artificial Intelligence*, Stockholm, August 1999.
78. "Computer Vision Systems", *European Conference on Artificial Intelligence*, Amsterdam, August 1994.

## Patents and Invention Disclosures

Mobile Robot, P. Jensfelt & H.I. Christensen, World Patent (EP1804149).

Förfarande för en anordning på hjul (Eng: Methods for a thing on wheels), G. Zunino & H.I. Christensen, Swedish Patent (SE0200197)

Position Estimation Method, H.I. Christensen & G. Zunino, World patent (WO03062937)

FoD Detection using Laser Scanning, A. Trevor & H. I. Christensen, GT Invention 5850 / Prov. Patent 61/694,361

Verification of as Built Structures, A. Trevor & H.I. Christensen, GT Invention 5851 / Prov. Patent 61/694,378

CAD Simplification for Visual Servoing. C. Choi & H.I. Christensen, GT Invention 5162

Mapping with Virtual Measurements, J. G. Rogers, A. Trevor and H. I. Christensen, GT Invention 5160

Optical Measurements of Drilled Holes, K. Hatzilias, H. Bergman, & H. I. Christensen, US Patent 8,842,273

A method for relieve confusion in Alzheimer patients based on in-Ear EEG monitoring, H. I. Christensen & T. Anderson (Provisional 2016)

Robotic Destination Dispatch Sytem for Elevators and Methods for Making and Using Same, A. Cosgun & H. I. Christensen, 2018

## VI. SERVICE

### Professional Service

#### Academic Community Service

- Data Ethics Expert Group - Danish Department of Commerce . . . Jan – October 2018
- World Robotics Summit - Advisory Board (NEDO) . . . . . 2016–
- National Research Council / National Academies - Panel on “Automation / IT and it impact on Employment” . . . . . 2015-2017
- Founder and Coordinator of US Robotics Virtual Organization . . . . . 2012–2016
- Member of College Industry Council on Material Handling Education (CICHME) w. Material Handling Industry of America . . . . . 2012–2014
- Member of Board - Danish Foundation for Strategic Research - Strategic Growth Technologies . . . . . 2011-2014
- Chair of CCC road-mapping committee for formulation of a national strategy for robotics . . . . . 2008–2009
- Member of academic board for KTH . . . . . 2003–2007
- Member of the Board of Trustees the Swedish Foundation for International Cooperation in Research and Higher Education – STINT, Appointed by the Swedish Government. . . . . 2002-2007
- Served on Ph.D committees in Norway, Sweden, U.S.A., Portugal, France, Belgium, Canada, Australia, Netherlands, Germany Spain, U.K. and Denmark for a number of candidates

#### Involvement with professional organizations

- Robot Industry Association (RIA) - Board Member at Large . . . . . 2013-2016
- RIA Committee on AI . . . . . 2018–
- IEEE liaison with Congressional Caucus on Robotics . . . . . 2015–2019
- IEEE Fellow . . . . . 2015
- Senior Member . . . . . 2008–2014
- Member . . . . . 1988–2007
- Computer Society, and Robotics and Automation Society.
  - IEEE Fellow Selection Committee . . . . . 2017–
  - RAS TAB Member at Large . . . . . 2008–2009
  - RAS Award Nominations Co-Chair . . . . . 2008, 2009
  - RAS STCP Member . . . . . 2006–2009
- Founding chairman for the Danish OS-9 User Group . . . . . 1992–1992
- Board member . . . . . 1994–1996
- Danish Chapter of the International Association of Pattern Recognition, Secretary . . . . . 1989–1994
- Founding chairman of the Danish Silicon Graphics Users Group . . . . . 1993–1995



- Co-editor of UN/IFR World Robotics — Section on Service Robotics (w. Martin Hägele & Jan Karlsson) . . . . . 2002-2003

### Campus Service

- HDSI Senior Recruiting Committee . . . . . 2019–
- MSCOM member . . . . . 2017–
- Robotics Area Hiring Chair . . . . . 2017 –
- CSE Robotics Concentration Co-Chair . . . . . 2017 –
- Robotics Area Chair (IC/CoC) . . . . . 2015-2016
- Devices Thread Coordinator (CoC) . . . . . 2015-2016
- Member of CoC Dean 5 year review committee . . . . . 2015
- PhD Recruiting Chair, SIC . . . . . 2014, 2015
- Member of AE faculty hiring committee . . . . . 2013-2014
- Member of ISYE Coca-Cola Chair Search Committee . . . . . 2013-2014
- Member of External Faculty Board, Georgia Tech Manufacturing Institute . . . . . 2012–2014
- Member of Interim Steering Committee for Institute for Big Data . . . . . 2012–2013
- Chair Search Committee for Chair of School of Computer Science, CoC, . . . . . 2011–2012
- HUSCO-Ramirez Search Committee, School of Mechanical Engineering, Spring . . . . . 2011-2013
- Co-chair of IC Awards Committee, . . . . . 2012
- Member of IC Awards Committee, . . . . . 2011
- Member of CoC RPT Committee, . . . . . 2009-2013
- Member of Selection Committee for Dean of College of Computing, . . . . 2009-2010
- Member of School Chair Evaluation Committee - Interactive Computing, . . . . 2009
- Member of Selection Committee for Senior Vice Provost for Research and Innovation (SVPRI), . . . . . 2007

### Reviews for conferences and journals

- Performed journal reviews for IEEE Trans. on Patt. Anal. Mach. Intell., Pattern Recognition, Pattern Recognition Letters, Intl. Jour. of Patt. Recog. and Artificial Intelligence, Artificial Intelligence Journal, Robotics and Autonomous Systems, Medical and Biological Engineering, Image and Vision Computing, Computer Vision and Image Understanding, IEE Proceedings: Signals, Speech and Vision, IEEE Signal Processing, IEEE Robotics and Automation, Machine Vision and Applications, IJCV, and Artificial Intelligence.
- Intl. Conf. on Patt. Rec., Technical Program Committee, Istanbul, August, 2010.
- Robotics Science and Systems, Associate Editor, Zaragoza, Jun 2010.
- Intl. Conf on Robotics and Automation, Associate Editor, Kobe, JP, May 2009
- BioRobotics 2006, PC member, Pisa, February 2006.
- International Symposium on Robot Systems (IROS), PC-member, Sendai, September 2004.

- Intl Symposium on Robotics, member of programme committee, Paris, June 2004.
- Information Fusion 2004, PC-member, Stockholm, June 2004.
- Intl. Conf on Robotics and Automation, member of prog. committee, Sendai, May 2004.
- Intl. Conf on Robotics and Automation, Member of Programme Committee, Taiwan, Sept. 2003.
- Multi-Sensory Fusion, MFI-2003, Member of Programme Committee, NINII, Tokyo, July 29-August 1, 2003.
- International Conference on Advanced Robotics, Member of Programme Committee, Coimbra, June 2003.
- item Mediterranean Control and Automation Conference, Member of Programme Committee, Lisboa, July 2002
- European Workshop on Robot Learning, Member of programme committee, Prague, September 2001.
- IARP Workshop on Technical Challenge for Dependable Robots in Human Environments, Member of Programme Committee, Seoul, Korea, May 2001.
- Scandinavian Conference on Artificial Intelligence, Member of PC, Odense, Denmark, February, 2001.
- International Conference on Robot Systems (IROS), Member of Programme Committee, Tokyo, Japan, October 2000.
- International Conference on Pattern Recognition, Member of Programme Committee, Barcelona, August 2000.
- Intelligent Autonomous Systems – 6, Member of International Advisory Board, Venice, July 2000.
- 6th European Conference of Computer Vision, Member of Programme Committee, Dublin, June 2000.
- International Joint Conference of Artificial Intelligence, Member of Programme Committee, August 1999.
- European Conference of Artificial Intelligence, Member of Programme Committee, Brighton (UK), 23-28 August 1998
- Empirical Evaluation of Methods in Computer Vision, IEEE Workshop, Member of Programme Committee, Santa Barbara, Ca, June 1998.
- 5th European Conference on Computer Vision, Member of Programme Committee, Freiburg, June 1998.
- Sensory Fusion and Decentralized Control in Autonomous Robotic Systems, SPIE Conference 3209, Pittsburgh, PA, Member of Programme Committee, October 1997.
- 5th International Robotics Symposium (IROS), Member of Programme Committee, Japan, August 1996.
- 14th Intl Conf on Pattern Recognition, Member of Program Committee, Vienna, August 1996.
- 4th Symposium on Intelligent Robotics Systems, member of programme committee, Lisbon, Portugal, July 1996.
- 4th European Conference on Computer Vision, Member of Programme Committee, Cambridge, May 1996.
- IEEE Workshop on Computer Vision. Member of Program Committee, Miami, December 1995.

- Symposium on Intelligent Robotics Systems '95: Member of Programme Committee, Pisa, July 1995.
- 9th Scandinavian Conference on Image Analysis: Danish Member of Program Committee, Uppsala, May 1995.
- IEEE Applications of Computer Vision, Member of program committee, Sarasota, Fl., December 1994.
- Intelligent Robotics Systems '94: Member of Program Committee, Grenoble, July 1994.
- Intelligent Robotic Systems '93: Member of Program committee, Zakopane, July 1993.
- SPIE Application of AI XI: Machine Vision and Robotics, Member of Programme Committee and Session Chair. Orlando, April 1993.

### Professional reviews

- Review of Graduate Programs, Faculty of Engr., Aalborg University, Aug 2018.
- Project and lecture reviewer at Faculty of Engr., University of Trondheim, Norway, 1994–1997.
- Served on professional appointment committees in Denmark, Spain, Sweden, Norway, United Kingdom, Belgium, Italy, France, Germany, Switzerland, South Korea, UAE, and U.S.A.

### Reviews for funding agencies

- DFG - SFB Panel in Robotics / Embedded Systems, Bonn, . . . . . Jun 2018
- EPSRC UK Robotics and Artificial Intelligence Hubs in Extreme and Challenging Environments . . . . . Jun. 2017
- EPSRC UK Robotics Research . . . . . Jan. 2017
- Italian Institute of Technology (RPT) . . . . . Jun. 2015
- JST - ERATO Selection Committee . . . . . Jan. 2014
- EU Cognitive Systems, IP Reviewer, . . . . . , 2013
- NSF Expedition Panel (phase II), . . . . . , Spring 2012
- SSF Successful Research Leaders - Sweden, . . . . . Spring 2011
- US Army Basic Research Review Panel, . . . . . July 2010
- SSF Future Research Leaders - Sweden, . . . . . June 2010, June 2013
- High Technology Foundation - Denmark, . . . . . May 2010
- NSF ad-hoc project reviews . . . . . , 2009–
- NSF IGERT Panel, . . . . . May/June 2009.
- NSF Computer Infrastructure Grant Panel, . . . . . Nov. 2008
- Army Research Laboratory, Basic Research Review, . . . . . Spring 2008
- Adviser/Expert to EU DG-III Long Terms Research Office in the areas of “robotics” and “computational vision” . . . . . 1995–2006
- Scientific Advisor to the Swedish Foundation for International Cooperation in Research and Higher Education, STINT . . . . . 2000–2002
- Member of the Danish Reviewer Panel for Computer Science, Ministry of Education, . . . . . 1995–1998, 2003–2005.

- Proposal reviewer for ESPRIT DG-XIII Basic Research office for the ESPRIT III and IV call for proposals and DG-III Long Term Research Office . . . . . 1999-2004.
- Member of SSF Japan committee for Swedish - Japanese Collaboration on Interdisciplinary Research . . . . . 2001-2002
- Member of the Danish Reviewer Panel for Electronic Engr., Ministry of Education, . . . . . 1995-1998.
- Action reviewer for ESPRIT DG-III Basic Research, Long Term Research, and Essential Technologies offices for several EU Projects. . . . . 1993-1998
- Member of International Review Panel: “Embedded Systems” for the Swedish National Board for Industrial and Technical Development, NUTEK, . . . . . May 1996.

## Editorial Leadership

- Associate Editor for *Science Robotics*, . . . . . 2017–
- Chair Advisor board for *IEEE Transactions on Automation Science and Engineering (T-ASE)* . . . . . 2014-2015
- Co-editor-in-chief for *Briefs in AI*, Atlantic Press, . . . . . 2015-2018
- Advisor board for *IEEE Transactions on Automation Science and Engineering (T-ASE)* . . . . . 2013-2014
- Senior Advisory Board *Journal of Human-Robot Interaction* . . . . . 2012-2016
- Co-Editor in Chief of *Trends and Foundations in Robotics*, . . . . . 2009–
- Editorial Board of *Advanced in Interaction Studies*, . . . . . 2010–
- Associate Editor of *Image and Vision Computing*, . . . . . 2009-2015
- Associate Editor of *Service Robotics*, . . . . . 2005-2010
- Associate Editor of *Autonomous Robots*, . . . . . 2005-2009
- Associate Editor of *International Journal of Robotics Research*, . . . . . 2002–
- Associate Editor of “Springer Tracts in Advanced Robotics”, . . . . . 2001-2015
- Associate Editor of MIT Press series on “Intelligent Robotics and Autonomous Agents”, . . . . . 1997–
- Associate Editor of *AAAI AI Magazine* . . . . . 2000-2007
- Associate Editor of *Journal of Pattern Recognition and Artificial Intelligence*, WSP . . . . . 1997-2005
- Associate Editor of *Journal of Machine Vision and Applications*, Springer Verlag . . . . . 1996-2004
- Associate Editor of *IEEE Transactions on Pattern Analysis and Machine Intelligence* . . . . . 1999-2003
- Associate Editor *Robotics and Autonomous Systems* journal, Elsevier, Competition Corner, . . . . . 1999-2002

## Leadership in organisation of meetings:

- ISRR-2019 - Co-organizer, Hanoi . . . . . Oct 2019

ICRA-2018 - Government Forum Co-Chair . . . . .	June 2018
ICRA-2017 - US Program Co-Chair, Singapore . . . . .	May 2017
ISRR-2015 - US Chair, Italy . . . . .	Sep. 2015
5th IDEAS - Surgical Robotics WS, Harvard Medical School, Co-organizer, . . .	Mar. 2015
IAS-13, Steering Committee, Venice, . . . . .	Jul. 2014
4th IDEAS - Surgical Robotics WS, Harvard Medical School, Co-organizer, . . .	Apr. 2014
8th Schunk Expert Days, Co-Chair, Lauffen, DE, . . . . .	Feb 2014
ISRR-2013, Finance/US Chair, Singapore, . . . . .	Dec. 2013
3rd IDEAS - Surgical Robotics WS, Harvard Medical School, Co-organizer, . . .	Apr. 2013
7th Schunk Expert Days, Co-Chair, Lauffen, DE, . . . . .	Feb 2013
IROS-2012, Senior Program Committee, Portugal, . . . . .	Oct. 2012
IAS-12, Regional Program Chair, Seoul, Korea, . . . . .	Aug. 2012
ICRA-2012, General Co-Chair, . . . . .	May 2012
2nd IDEAS Symposium, Co-organizer, Harvard Medical School, . . . . .	April 2012
IROS-2011, Special Symposium Committee, . . . . .	Oct. 2011
ISRR-2011, General Chair, Flagstaff, AZ, . . . . .	Aug. 2011
Ro-Man 2011, General Chair, Atlanta, GA. . . . .	Aug. 2011
Schunk Expert Days, Co-Chair, Lauffen, DE, . . . . .	Feb 2011
IAS-11, Program Chair, Ottawa, Canada, . . . . .	Aug. 2010
Schunk Expert Days, Co-Chair, Lauffen, DE, . . . . .	Feb 2010
Ro-Man 2009, PC - Co-Chair (Americas), Toyama - JP, . . . . .	Sep. 2009.
IROS-2009, US Program Chair, Lucerne, CH, . . . . .	Sep. 2009.
Schunk Expert Days, Co-Chair, Lauffen, DE, . . . . .	Feb 2009
HRI - 2008, Senior Programme Committee, Amsterdam, . . . . .	April 2008,
IROS, US Program Chair, Nagasaki, . . . . .	Nov. 2007.
ICRA-2007, Programme Co-chair – Europe, Rome, . . . . .	April 2007.
HRI 2007, Senior Program Committee, Washington, . . . . .	March 2007.
HRI 2006, Senior Programme Committee, Utah, . . . . .	March 2006,
19th Intl Joint Conf on Artificial Intelligence, Edinburgh, Senior Program Committee, . . . . .	Aug. 2005.
ICRA-2005, European Programme Co-Chair, Spain, . . . . .	April 2005.
Field deployable robots, NATO IST Workshop, Co-chair, Bonn, . . . . .	Sept 2004
RAS-IFRR Summer school on “Human-Robot Interaction”, Co-organiser, Volterra, . . . . .	July 2004.
Robotics demining, Brussels, co-organiser, Belgium, . . . . .	June 2004.

Wallenberg Symp. on Sensing and Feeling, Co-organiser, . . . . . May 2004.  
 Educational Robotics, Co-organiser, ICRA-04 Workshop, New Orleans, . . . . . April 2004.  
 Challenges in Cognitive Vision, NIPS workshop, Co-organiser, . . . . . Dec. 2003  
 Cognitive Vision Systems, Dagstuhl Seminar, Co-organiser, . . . . . Oct. 2003  
 Nobel Symposium on Neural Control of Skilled Hand Movements:  
 Cognitive and Computational Aspects, Stockholm, Co-organiser, . . . . . June 2003.  
 Intl Conference on Vision Systems, Steering Committee, Graz, . . . . . Mar. 2003.  
 WS on Control Problems in Robotics and Automation,  
 General Chair, Las Vegas, . . . . . Dec. 2002.  
 IROS-2002, European/African Programme Chair, Lausanne, . . . . . Oct. 2002.  
 International Symposium on Robotics, Service Robotics Chair, Stockholm, . . . . Oct. 2002.  
 WS on Robot Dependability, IARP, Organising Committee, . . . . . Oct. 2002.  
 Wallenberg Symp. on Learning and Memory: Brains to Robots,  
 Member of Organisation Committee, Stanford, . . . . . Oct. 2002.  
 Summerschool on “Simultaneous Localisation and Mapping”,  
 Organiser, Stockholm, . . . . . Aug. 2002.  
 ECAI, Vision-Robotics Chair, Toulouse, . . . . . Aug. 2002.  
 ICPR, Computer Vision Co-Chair,  
 Quebec City, . . . . . Aug 2002.  
 Tutorial on “Mobile Robot Programming Paradigms”, Co-organiser  
 (with Greg Hager, JHU), ICRA-2002, Washington, . . . . . May 2002.  
 3rd Ws. on Empirical Eval. Methods in Comp. Vis., Co-Chair, Maui, . . . . . Dec. 2001.  
 WS on Computer Vision Systems, Co-Chair, Victoria, Canada, . . . . . July 2001  
 Modeling of Sensor Based Intelligent Robot Systems,  
 Co-organizer, Dagstuhl, Wadern, . . . . . Oct. 2000.  
 1st Swedish Autonomous Robotics Symposium, Co-chair, Örebro, . . . . . Oct. 2000.  
 ECAI, Area Chair (Robotics and Vision), Berlin, . . . . . Aug. 2000.  
 2nd International WS on Perf Char., European Programme Chair, Dublin, . . . . June 2000.  
 1st ICVS, Las Palmas, Programme Chair, . . . . . Jan. 1999.  
 Environmental Modelling for Mobile Robotics, Schloss Dagstuhl Workshop,  
 Weidern, Co-organiser, . . . . . Sep. 1998.  
 Knowledge Based Methods for Computer Vision, Schloss Dagstuhl Workshop, Weidern,  
 Co-organiser, . . . . . Dec. 1997.  
 5th SIRS, Programme Chair, Stockholm, . . . . . July 1997.  
 Performance Characteristics of Vision Algorithms, Co-chair programme committee  
 with Prof. W. Förstner, Cambridge, UK, . . . . . April 1996.  
 Active Vision Hardware Workshop, Co-Organiser w. Prof. J.L. Crowley,  
 Grenoble, France, . . . . . Feb. 1995.

Nordic Summer School on Active Vision and Geometric Modelling,  
Organiser. Rebild Bakker, Aalborg, . . . . . Aug. 1992.

SPIE Applications of Artificial Intelligence X: Machine Vision and Robotics,  
Programme Committee, Organiser and chairman of session on  
“How to Design a Robot Head”. Orlando, . . . . . April 1992.

7th Scandinavian Conference on Image Analysis.  
Chair of Local Arrangements. Aalborg, . . . . . Aug. 13–16, 1991.

Topical Workshop on Symbolic Reasoning in Scene Interpretation, Co-organiser,  
LIFIA, France. ESPRIT Vision Workshop Week. Crete, . . . . . Sep. 1990.

Topical Workshop on Perceptual Control, Co-organiser, Aalborg University.  
ESPRIT Vision Workshop Week. Crete, . . . . . Sep. 1990.

4th Aalborg Symposium on Vision: Concurrent Computer Vision '89, Co-organiser,  
Institute of Electronic Systems, Aalborg, . . . . . Jan. 24–26, 1989.

3rd Aalborg Symposium on Vision: Hybrid Methods '87, Co-organiser,  
Institute of Electronic Systems, Aalborg, . . . . . Dec. 10–11, 1987.

2nd Aalborg Symposium on Vision: Robot Vision '86, Co-organiser,  
Institute of Electronic Systems, Aalborg, . . . . . Dec. 15–17, 1986.

## Research Grants:

ONR: DURIP - Instrumentation for the AeroDrome (\$500k, Co-PI)

LGe: ROS 2.0 Service Robot (\$150k, 2019), PI

RPD Innovation: Robotics and Artificial Intelligence (AI) System for Industry 4.0, (\$574k, 2019-2020), PI

SPAWAR: Intelliegnt Diagnostics of V-22 Osprey (\$1M, 2020), Co-PI

SPAWAR: Data Science Support for SPAWAR 4.0 Logistics (\$500k, 2018-2020), PI

TuSimple - Assessment of Level 4 Autonomy in Trucks, (\$250k, 2018-2019), PI

ARL: Autonomous Resilient Cognitive Heterogeneous Swarms (DCIST) - (\$6.3M, 2018-2023), UCSD PI

LGe: Tools for embedded robots development (\$125k, 2017), PI

Qualcomm: Long-Term Autonomy (\$80k, 2017), PI

NSF: NRI:Workers, Firms, and Industries in Robotic Regions (\$784k, 2016-2017), Co-PI

NSF: Revision of the national robotics roadmap (\$35k, 2016), PI

Boeing: Fixture Less Machining (\$200k, 2016-2017), PI

Boeing: Assembly Inspection using Augmented Reality (\$49k, 2015), PI

Thyssen Krupp: Robot Control for Elevators, (\$80k, 2014-2015), PI

Boeing: Augmented Reality (\$49k, 2014)

NSF: NRI: Representing and Anticipating Actions in Human-Robot Collaborative Assembly Tasks (\$800k, 2014-2016), Co-PI.

NSF: NRI PI Meeting (\$114k, 2014), PI

NSF: EAGER - Physical Flow and other Industrial Challenges, (\$300k, 2014-2015), Co-PI  
NSF: Opportunities in Manufacturing, Robotics and Computer Science (\$48k, 2013-2014), PI  
Boeing: High precision robot manufacturing (\$600k, 2013-2015), PI  
Boeing: Vision for Augmented Reality (\$17k, 2013), PI  
NSF: NRI PI Meeting (\$104k, 2013), PI  
Micro Autonomous Systems Technology - Army Research Laboratory CTA: Autonomy (2013-2017) - PI for GT (\$1.9M). Lead UPENN (Total \$20M)  
PSA: Robotics for Automotive Assembly (\$910k, 2013-2015), PI  
BMW; Support on the Shop-Floor Using Modern Robots (\$750k, 2012-2015), Co-PI  
Mitsui/Motoman: Laboratory Automation (\$164k, 2012-2014), PI  
NIST: Robots for Kitting (\$99k, 2012-2014), PI  
Boeing: Wing Assembly (\$1.4M, 2011-2014), PI  
NSF: Robotics Virtual Organization (\$100k, 2011-2013), PI  
NSF: Motion Grammar Laboratory - Equipment Grant (\$330k, 2011-2013), Co-PI  
Boeing: UGV Navigation for OmniMove (\$146k, 2010), PI  
MSR: Computer Vision Library for RDS (\$25k, 2010), PI  
MSR: Software Engineering for Robotics (\$75k, 2010), PI  
NIST: Mixed Palletizing (\$170k, 2009-2012), PI  
KOTEF: Cognitive Consumer Robots (\$2.4M, 2009-2011), GT-PI  
NSF: Young Researchers Workshop - 2009 (\$24k), PI  
NRL: Disruptive Technologies for General Infra-structure (\$25k, 2008-2009), PI  
GM: Factory CoWorker - (\$400k/yr, 2008-2010), Co-PI  
Boeing: Factory of the Future - Robotics (\$700k, 2008-2014), PI  
KUKA: UGV Survey, KUKA Roboter, Germany, Oct. 2008 (\$6k) PI  
Micro Autonomous Systems Technology - Army Research Laboratory CTA: Autonomy (2008-2013) - Co-PI for GT (\$4M). Lead UPENN (Total \$33M)  
CCC: From Internet to Robotics: The Next Transformational Technology (\$200k, 2008-2009), PI  
KUKA: Unlayering, KUKA Roboter, Germany, Jul. 2008 (\$18k)  
KUKA: Exploratory research on diagnostics and navigation, KUKA Roboter, Germany, Spring 2008 (\$55k)  
CEC: CoSy - Cognitive Systems for Cognitive Assistants, IP Project, Coordinator (11M EUR, 2004-2008)  
VR: Multi-Modal Mapping (1.7M SEK, 2006-2008), PI.  
CEC: Neurobotics – Neuroscience/Robotics, IP Project, Co-investigator (6.4 M EUR, 2004-2007)  
CEC: Cognitive Companion – Cogniron, IP Project, Co-investigator (6.8M EUR, 2004-2007)



CEC: EURON-II – EU Network of excellence within “beyond robotics” – Coordinator (5.8M EUR, 2004-2007)

SSF, Autonomous Systems, Principal Investigator – Director (7 M SEK, 2003–2006)

FMV: Intelligent Unmanned Vehicles, Technology Demonstrator, Coordinator, (8M SEK, 2001-6).

FMV: UGV control using the universal control station, 2005 (200k SEK)

CEC: Cognitive AI Enabled Computer Vision network, Research Co-ordinator, (3.4 M EUR, 2002-2005).

STINT: Institutional Grant for KTH-ANU Collaboration in the area of Collaborative Robotics, Co-chair (2M SEK, 2001-2005).

CEC: CogVis – “Cognitive Vision”, IST Research Project (IST-2000-29375), Coordinator, (4 M EUR, 2001–2004).

FOI: “Information Fusion”, academic co-chair, (1.8M SEK, 2001-2004).

CEC: OROCOS – “Open Robot Controller Software”, (IST-2000-31064), Co-investigator (60k EUR, 2001-2003).

CEC: EURON – European Robotics Research Network (IST-2000-26048), Coordinator, (1.035M EUR, 2000-2003)

CEC: PCCV – “Performance Characterisation of Computer Vision”, co-principal investigator, (180k EUR, 2000-2003)

NUTEK Complex Technical Systems “Sensory Fusion for Robot Navigation”, (1.8M SEK, 1999-2001)

NUTEK Complex Technical Systems “Architectures for Mobile Robotics”, (2.2M SEK, 1999–2001)

Foundation for Strategic Research: Centre for Autonomous Systems (63M SEK, 1997-2001). Scientific Director.

CEC: TMR network “CAMERA”, co-principal investigator (104k EUR, 1998-2001)

NUTEK Exploratory Grant “Intelligent Crane Control”, co-principal investigator, (450 k SEK, 1999-2000)

NUTEK Exploratory Programme Grant “Intelligent Outdoor Vehicles”, (200k SEK, 1999)

STINT Visiting Professor Grant (for Prof. Ronald Arkin) (755k SEK, 1997–1998).

CEC: TMR Network on “Vision for Robot Guidance”, Co-proposer and local manager (1.4M EUR, 1996–1997).

CEC: TMR Network on “Sensory Mobile Autonomous Robot Technology II”, Co-proposer and local manager. (2.3M EUR, 1996–1997).

Danish Technical Research Council: “Reconstruction and Visualisation of 3D Structures based on In-vivo Image Analysis”, Principal Investigator (1.014M DKK, 1995–1998).

EEC: European Network of Excellence in Computer Vision, Co-proposer and Principal Investigator (2M EUR, 1994–1998).

EEC: HCM Network on “RETINA: Active Vision”, Co-proposer and local manager. (3M EUR, 1994–1997).

LUKAS/SPIN: Software Process Improvement Network. Funded by EU and Regional Council for North Jutland. Member of Board and Principal Investigator (8M DKK, 1995–1996).

EEC: HCM Network on "Sensory Mobile Autonomous Robot Technology", Co-proposer and local manager. (2.9M EUR, 1993–1995).

DOAP: Data Acquisition, - Analysis, and Presentation, LUKAS – Regional Development Fund, North Jutland Regional Council, Co-Proposer and Technical Coordinator. (6M DKK, 1993–1995). Member of Executive Board for the LUKAS software quality assurance project (1994–1995).

EEC: Vision as Process-II, P-7108-VAP-II, Co-proposer and local manager (3M EUR, 1992–1995).

NorFa: Nordic Research Network on Computer Vision, Co-proposer and ass. coordinator. (150k DKK, 1992–1995)

EEC: Vision as Process, BR-3038-VAP, Co-proposer and local manager (4.7M EUR, 1989–1992).

NorFa: Nordic Ph.D Summer School, Rebuild, August 1992, Proposer and coordinator. (200 k DKK)

## Gifts:

LGe: Next Generation Home Robots (\$120k, 2019-2020)

Qualcomm/UCSD: Digital Collaboratory in Smart Transportation (\$350k, 2017-2018)

Honda, Collaborative Robotics (\$50k, 2018, 2019)

Northrup Grumman Group, AUS systems (\$100k, 2018)

Qualcomm: Contextual Robotics (\$800k, 2017-2018)

Qualcomm: Long-term autonomy (\$125k, 2017)

Kelly Family: \$20k grant for distinguished lecture series on robotics and employment (2015-2016)

Intel: \$10k equipment donation (2015)

National Instruments: \$80k equipment donation (2011-2012).

Coca Cola Bottling Company: \$2M equipment donation for setup of a logistics laboratory (2011).

Private Donation: \$5k award money for the Dick Volz PhD Award (2011)

General Motors: \$12k for promotion of next generation manufacturing (2010)

KUKA: Endowment (\$1.5m, 2016)

## Honors and Awards:

Elected Fellow, Institute of Electrical and Electronic Engineers (2015)

Honorary Doctorate in Engineering (Dr. Techn. h.c.), Aalborg University (2014)

Elected Fellow, American Association for the Advancement of Science (2013)

Boeing Supplier of the Year Award (2012)

Dean's Award, College of Computing, GT (2012)

*The Joseph Engelberger Award*, Robot Industry Associations (RIA - 2011)  
Outstanding Innovation in Research, Faculty Award, Georgia Tech (2011)  
Member of NSF CISE Advisory Board (2011-2015)  
Member of Robotics Technology Consortium (RTC) Board (2011-2014)  
Senior Technology Seat/CTO (2013-2014)  
Named IEEE Senior Technical Expert (2009–2012)  
Peter Freeman Award, College of Computing, GT (2008)  
Elected Senior Member of IEEE (2008–2014)  
Member of Advisory Board - Bio-Robotics Prog. Univ. of Utah (2008–2013)  
Member of Advisory Board - NSF Ctr. Quality of Life Technology, CMU (2007–2014)  
IEEE RAS Distinguished Lecturer in Robotics (2004-2006)  
Member of Scientific Advisory Board, Robotics Institute, CMU. (2004–)  
Elected Officer of International Foundation of Robotics Research (2003–)  
There are at anytime only 24 officers – 8 from US, Asia and Europe, respectively.  
Treasurer/Secretary for Technical Activities - Executive Officer (2010–)  
ICRA-2004 Short-listed for best vision paper “Measurement Errors in Visual Servoing” authored by V. Kyrki, D. Kragic and H. I. Christensen.  
ICRA-2003 Best Paper on Manipulation: “Automatic Grasp Planing using Shape Primitives” authored by A. Miller and S. Knopp, H.I. Christensen and P. Allen.  
IROS-2002 Best Paper Award “Behavior Coordination for Navigation in Real-World Office Environments” authored by P. Althaus and H.I. Christensen.  
Jury Member of Robot Hall of Fame (2003–2013), Carnegie Mellon University, Pittsburgh, PA.  
The Foundation Vision North 1991 Research Award.  
Contribution to advancement of research at the Laboratory of Image Analysis, Aalborg University.  
August 1991.

June 19, 2020