Curriculum Vitae

Name:	Catholijn M. Jonker
Date and place of birth:	August 14, 1967, Leiden, The Netherlands
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Title:	Full professor
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Education

Year	Institution	Degree	Field of study
1994	Utrecht University	PhD Computer Science	Constraints and Negations in Logic Programming
1990	Utrecht University	MSc Computer Science	Parallel & Distributed Systems, Logic
1985	Ashram College	VWO-beta	Science, Mathematics I, Mathematics II, Biology, Chemistry, Dutch, English, Latin

Work experience

2011 – 2012	Research Consultant, Almende B.V. Research Institute
2006 – present	Full professor Interactive Intelligence, Faculty of Electrical Engineering, Mathematics and Computer Science, Delft University of Technology
2004 – 2006	Full professor Artificial Intelligence / Cognitive Science, Nijmegen Institute for Cognition and Information (now Donders Institute), Radboud University Nijmegen
2004	Associate Professor & group leader of the Agent Systems Research Group, Faculty of Sciences, Vrije Universiteit Amsterdam
2000 – 2001	Artificial Intelligence Consultant, American Management Systems, Europe
1995 – 2003	Assistant Professor of the Agent Systems Research Group, Faculty of Sciences, Vrije Universiteit Amsterdam, group leader since 2000
1994 – 1995	Postdoc Theoretical Computer Science and Logic, Institut für Informatik und angewandte Mathematik, Universität Bern
1993	Research Assistant Theoretical Computer Science and Logic, Institut für Informatik und angewandte Mathematik, Universität Bern
1990 – 1994	PhD student, Department of Computer Science and department of Philosophy, Utrecht University

Awards and Honours

2007 – 2013	VICI winner, "Onderhandelen ondersteund", NWO-STW, http://www.nwo.nl/nwohome.nsf/pages/NWOA_4YJDQ3_Eng

| 2005 – 2010 | Member of De Jonge Akademie, KNAW (Royal Netherlands Academy of Arts and Sciences). Chairperson 2005 – 2007. Statutory limitation on membership of five years |
| 2005 – | Member of the Koninklijke Hollandsche Maatschappij der Wetenschappen (Royal Holland Society of Sciences and Humanities) |

Research interests

My mission is to create synergy between humans and technology. To this purpose I study and model forms of natural intelligent reasoning and interaction, I develop models of new forms of intelligent reasoning and interaction, and I apply these models in case studies and prototypical systems in multiple contexts, such as healthcare, well-being, entertainment, safety and security.

Society shows an increasing need for intelligent systems to support humans in complex multi-actor tasks, such as decision making, support of elderly and patients, or emotional and social interaction. In the future is that humans and intelligent systems (also called intelligent agents) will form ad hoc coalitions and by co-evolution both humans and intelligent agents will improve their effectiveness. In order for such cooperation to work, intelligent agents need to have situated awareness and need to work seamlessly with and for humans. Seen from the human perspective, agents furthermore need to be able to explain their purpose, way of working, and limits of their capabilities.

My contribution is modelling, analysis, and simulation of behaviour of individuals. In particular I focus on human reasoning capabilities and those concepts that are on the border between the human being as an individual and the human being as a social being, such as negotiation, national culture, trust, theory of mind, organisation/team formation, and the concept of shared mental models.

I am one of the founders of the DESIRE design method and software environment for the DEsign and Specification of Interacting REasoning components, with which I designed and implemented many agent-based systems. Furthermore, I am one of the founders of the LeadsTo and Temporal Trace languages and their associated simulation environment.

As part of my research on automated negotiation and on negotiation support systems I instigated the design and development of the GENIUS environment for testing automated negotiating agents in negotiation domains of varying complexity. GENIUS is increasingly used by top research groups on automated negotiation, and is the vehicle of international competitions in this research field. Our negotiation strategies and opponent profiling techniques are consistently in the top of that competition.

Currently I am combining different aspects of my research into a negotiation support tool, called the Pocket Negotiator. In comparison to existing negotiation support tools the Pocket Negotiator stands out because of its application of new forms of preference and value elicitation, the use affective computing to train negotiators, the use of the top negotiation strategies found in the automated negotiation competition to suggest possible bids to the user and the use of graphical and opponent profiling tools to give the user insight in the progress of the negotiation.

Professional activities

Reviewing, boards and committees

I review for the leading conferences and journals in my field. I review grants for funding bodies in the Netherlands and internationally. I have organised my share of medium sized conferences and workshops. I am a senior programme committee member of the major conference (AAMAS) in my

field and am the Program Chair of AAMAS 2013 (http://ii.tudelft.nl/aamas2013/). I was a member of the Board of the international EURAMAS http://www.euramas.org.

I have served as board member of the Benelux Artificial Intelligence Association. I a member of the boards / jurier (sometimes as chair) of several national and international science prizes, general grants, and individual grants. I am regularly asked for evaluation committees of colleagues.

I was a member of the NWO (national funding agency of the Netherlands) initiated review board of STW (applied science funding agency). I am a board member of the National Network Female Professors (http://www.lnvh.nl), and of the board of DEWIS (Delft Women in Science). I was a member of the KNAW standing committee for the Cognitive Sciences. For KNAW I assessed symposia proposals. For efficiency reasons I limit my membership of Search and Advice committees for faculty members to 3 per year.

Team building

One of my strongest skills is that of building a team of people with diverse interests and capabilities. This skill I put to use as the first Chairperson of the Jonge Akademie (see Awards and Honours), as group leader at the NICI (now Donders Institute, Nijmegen), and presently as group leader at the TU Delft.

The structure and way of working that we, as first board of the Jonge Akademie have put into place, still holds.

At the NICI I was asked to make a good research team out of a group of people that regarded management as something rumoured to exist in the university and that only worked together to keep the study programmes up and running. I changed the attitude of the group, thus improving both research output and gaining support from higher management for this fine group.

TU Delft asked my help to create a team of three full time staff members of largely different research interests (mediated presence, educational and virtual reality therapy, and artificial intelligence), two part time full professors, and some 8 PhD students. The group has found its identity as researching Interactive Intelligence and has grown to 6 full time staff members, the same two part time full professors, 1 scientific programmer, 8 postdocs, and approximately 22 PhD students. The increase was funded by grants acquired by my group and me, and by my lobby for permanent staff with higher management.

Publications

H-index = 28 (Publish or Perish, April 24, 2012). Peer-reviewed journal papers: 76. Peer-reviewed conference and workshop papers: 197. Book contributions: 18. Other publications: > 20.

Editor of the special issue of IEEE Intelligent Systems on Human-Agent-Robot Teamwork, 2012. A list of 15 key publications can be found at the end of this document. For a complete list of my publications, see http://ii.tudelft.nl/~catholijn/cve/publ.pdf.

Grant funding

Personal funding has come from NWO/STW for my VICI project on negotiation (k€ 1250). Major funding I helped acquire a Co-PI has come from Agentschap NL (directly or through intermediate funding bodies) and FES (aardgasbaten), totalling k€ 9690. We have had 9 PhD students on a grant from the Chinese Research council (approximately k€ 1620). From companies I obtained k€ 340.

Collaborations

My work is collaborative, as is evident from my publications. I have collaborations within Europe, the Middle and Far East and the USA (including MIT) on the negotiation and shared mental models

research. Prof. Sarit Kraus (Bar Ilan University) was the first to recognize the worth of our negotiation environment and joined forces with us. Other top negotiation and agent technology researchers who joined our efforts are Prof. Nick Jennings (University of Southampton) and Dr. Takayuki Ito (Nagoya Institute of Technology. Nationally I cooperate with many scientists on the various topics of my research.

My students, post-docs and I frequently spend time abroad, and whenever possible I finance a three month stay of my PhD students with a top researcher in their field. We have many international visitors in the group (approximately six on average), and applied for and received Prof. Maria Gini from the University of Minnesota as visiting professor, paid by the KNAW Visiting Professors programme. We have a long standing cooperation with TNO and Philips through two part-time professors in our group.

Teaching

- Artificial Intelligence Techniques (high school, undergraduate and graduate level)
- Knowledge and Information Technology (undergraduate and graduate level)
- Agent Technology and Simulation (undergraduate, graduate, and post-graduate level)
- Application of Intelligent Systems in Context (undergraduate level)
- Behavioural Dynamics modelling (graduate level)
- Organisation Dynamics modelling (graduate level)
- General academic skills (undergraduate level)
- Logic and Computer Science (graduate level)
- Logics of Time and Nonmonotonic Reasoning (graduate level)
- Lambda Calculus (graduate level)
- Research Methods for Artificial Intelligence (post-graduate level)
- Electronic Commerce (post-graduate level)
- Modelling Cognitive Factors (post-graduate level)
- Negotiation and Negotiation Support Systems (graduate and post-graduate level)
- Human-technology interaction (post-graduate level)
- Thesis projects (undergraduate and graduate level)

Education related

- Organisation of winter/spring schools in Human-Technology Interaction
- Organisation of symposia for MSc and PhD students at various universities
- Organiser of a seminar on the use of the Internet for teaching (1997)
- Chair and Member of the Programme Committee of several study programmes
- Chair and Member of the Board of Examinations for several study programmes
- Student advisor and coordinator for AI
- Coordinator of "Student Acquisition" for Artificial Intelligence
- Jury for Young Talent Graduation prizes (national prizes in Computer Science)

Invited lectures at international workshops and conferences

I am regularly asked to speak at conferences and workshops in my own field.The invitations to give a keynote lecture at Artificial Economics and IFAC HMS show that my work is appreciated by research communities that for me are applications of my research. Intelligent Agent Technology as it is one of the more important conferences in my own research field.
- Artificial Economics 2011: "Agent-based simulation", September 2011.
- Intelligent Agent Technology 2011: "Development and Application of Rich Cognitive Models and

the Role of Agent-Based Simulation for Policy Making". August 2011.
- IFAC HMS, Valenciennes, august 2010, www.univ-valenciennes.fr/IFACHMS2010/

PhD Supervision

- Current PhD students: 14.
- PhD Completed:
  1. Tim Verwaart, personal funding, one day per week. 6 June 2011. (Jonker, Hofstede).
  2. Alin G. Chitu, Towards Robust Visual Speech Recognition; Automatic Systems for Lip Reading of Dutch. 2 November 2010. (Rothkrantz, Jonker).
  3. Dmytro Tykhonov, Negotiation and cognitive phenomena involved therein. 7 June 2010. (Jonker, Hindriks).
  4. Wilbert van Norden, Sensing What Matters. Spring 2010. (Jonker)
  5. Mark Hoogendoorn, VU, Analysis and simulation of organisation dynamics. 18 June, 2007. (Treur, Jonker).
  6. Tibor Bosse, Analysis and simulation of dynamic properties in agent systems. 2005. (Treur, Jonker).
  7. Wieke de Vries, verification of agents systems in dynamic environments. 2002. (Treur, Meijer, Jonker).
  8. Wouter Wijngaards, simulation and verification of agent dynamics in biological, cognitive, and social domains. 2002. (Treur, Jonker)

Grants (selection)

- "Sensing Heterogeneous Information Network Environment", 2012-2016, Co-PI, k€ 1330 budget, of which k€ 999 is a subsidy from the 3TU (cooperation of the three Technical Universities in the Netherlands). Our group has two PhD students in this project and the project leader.
- "Smart Roads" Agent-based driver support and smart roads for traffic throughput and road safety, 2012 – 2016, PI, k€ 1390 budget, of which k€ 628 subsidy by Next Generation Infrastructures. Our group has one PhD student in this project, and the project leader.
- "New Governance Models for Next Generation Infrastructures", 2011 – 2013, Co-PI, k€ 1350 budget, of which k€ 535 subsidy by Next Generation Infrastructures. Our group has one postdoc in this project.
- "Socially-Enriched Access to Linked Cultural Media", 2011-2015, Co-applicant. k€ 6000 budget, subsidy from FES Brain and Cognition. Our group has 2 PhD students in this project.
- "Onderhandelen ondersteund", 2008 – 2014, PI, k€ 1250 budget, VICI personal grant from NWO-TW. This project employs 4 PhD students and a postdoc.
- "Cybernetic Incident Management", 2003 – 2007, Co-applicant. Subsidy for our group was in the equivalent of 2.5 fte for 4 years by the Ministry of Economic Affairs, Senternovem (now called Agentschap NL). Our group hosted two PhD students in this project.
- "Distributed Engine for Advanced Logistics", 2002 – 2007. Co-applicant. Subsidy for our group was in the equivalent of 1 fte for 4 years added value by the Ministry of Economic Affairs, Senternovem (now called Agentschap NL). Our group hosted one PhD student in this project.
- "ForceVision", 2002 – 2010, PI, while I was involved we obtained the equivalent of 1.5 fte for 2 years from ForceVision. The project was continued after the first period.
- "Agent-based Distributed Agenda scheduling", 1996 – 1999, Co-PI, 250.000NLG (approximately K€ 110) from SenterNovem (now called Agentschap NL).

Activities for the general public

Making research accessible to the general public is purpose of giving invited lectures for various

organisations, writing for ICT related magazines and books, and accepting invitations for articles or interviews from national newspapers, radio and television. I mention a selection:

- National newspapers (Volkskrant, Vrij Nederland, Telegraaf, NRC, Spits) on topics amongst which: the Jonge Akademie, artificial intelligence, dog cognition, and the position of women
- National television and radio appearances: Hoe?Zo! NTR radio and tv, "Dat kan beter" VPRO tv, "Labyrinth" VPRO tv
- Book contibutions: NWO & Quest, Stichting Toekomstbeeld der Techniek (2 x), Rathenau
- DJA on Wheels, teaching research for a day at high school
- "Avond van de Wetenschap", Ridderzaal, Den Haag. A meeting of industry and science, attended by leading members of industry and science, and by the secretary of state of the Ministry of Economic Affairs.
- Member of the Board of Stichting Schuurman Schimmel – van Outeren. The foundation helps students financially to complete their studies.

Key Publications

1. Lin, R., Kraus, S., Tykhonov, D., Hindriks, K.V., and **Jonker, C.M.** (2011). Supporting the design of general automated negotiators. In: Ito, T., Zhang, M., Robu, V., Fatima, S., Matsuo, T., and Yamaki, H. (eds.), *Innovations in Agent-Based Complex Automated Negotiations, Studies in Computational Intelligence*, *319*, Springer Berlin / Heidelberg, pp. 69-87.
2. Johnson, M., **Jonker, C.M.,** Riemsdijk, M.B. v., Feltovich, P.J., & Bradshaw, J.M. (2009). Joint activity testbed: blocks world for teams (BW4T). In: Proceedings of the Tenth International Workshop on Engineering Societies in the Agents' World (ESAW'09), *Lecture Notes in Artificial Intelligence*, *5881*, Springer-Verlag, pp. 254-256.
3. Bosse, T., **Jonker, C.M.,** Meij, L. v. d., Sharpanskykh, A., & Treur, J. (2009). Specification and verification of dynamics in agent models. *International Journal of Cooperative Information Systems,18*, 167 - 193.
4. Bosse, T., **Jonker, C.M.,** & Treur, J. (2008). Formalisation of Damasio's theory of emotion, feeling and core consciousness. *Consciousness and Cognition Journal*, *17*, 94-113.
5. Tykhonov, D., **Jonker, C.M.,** Verwaart, D., & Meijer, S. (2008). Agent-based simulation of the Trust and Tracing Game for supply chains and networks, *Journal of Artificial Societies and Social Simulation, 11(3)*, 1.
6. Bosse, T., **Jonker, C.M.,** Meij, L. van der, & Treur, J. (2007). A language and environment for analysis of dynamics by simulation. *International Journal of Artificial Intelligence Tools*, *16*, 435-464.
7. **Jonker, C.M.,** Robu, V., & Treur, J. (2007). An agent architecture for multi-attribute negotiation using incomplete preference information. *Autonomous Agents and Multi-Agent Systems Journal*, *15*, 221 - 252.
8. Hindriks, K.V., **Jonker, C.M.,** & Tykhonov, D. (2006). Eliminating interdependencies between issues for multi-issue negotiation. In: Klusch, M., Rovatsos, M., and Payne, T.R., eds., Cooperative Information Agents X, Proceedings of Tenth International Workshop on Cooperative Information Agents, Edinburgh, United Kingdom, September 11 – 13, *Lecture Notes in Artificial Intelligence*, *4149*, pp. 301 – 316.
9. Bosse, T., & **Jonker**, C.M. (2005). Human vs. computer behaviour in multi-issue negotiation. In: Ito, T., Hattori, H., Matsuo, T., and Zhang, M. (eds.), *Proceedings of the First International Workshop on Rational, Robust, and Secure Negotiations in Multi-Agent Systems*, RRS'05, pp. 10-25.
10. Bosse, T., **Jonker, C.M.,** Mey, L. van der, & Treur, J. (2005). LEADSTO: a language and environment for analysis of dynamics by simulation. In: Eymann, T., et al. (eds.), Proceedings of

the Third German Conference on Multi-Agent System Technologies, MATES'05. *Lecture Notes in Artificial Intelligence*, *3550*. Springer Verlag, pp. 165-178.

11. Brazier, F.M.T., **Jonker, C.M.,** & Treur, J. (2002). Principles of component-based design of intelligent agents. *Data and Knowledge Engineering*. 41, 1-28.

12. **Jonker, C.M.,** & Treur, J. (2002). Compositional verification of multi-agent systems: a formal analysis of pro-activeness and reactiveness. *International Journal of Cooperative Information Systems*, *11*, 51-92.

13. **Jonker, C.M.,** & Treur, J. (2001). An agent architecture for multi-attribute negotiation. In: B. Nebel (ed.), *Proceedings of the 17th International Joint Conference on AI*, IJCAI'01. Morgan Kaufman, pp. 1195 - 1201.

14. Castelfranchi, C., Dignum, F., **Jonker**, **C.M.,** & Treur, J. (2000). Deliberative normative agents: principles and architecture. In: N.R. Jennings, Y. Lesperance (eds.), *Intelligent Agents VI. Proceedings of the 6th International Workshop on Agent Theories, Architectures and Languages*, ATAL'99. *Lecture Notes in Artificial Intelligence*, Springer Verlag, pp. 364-378.

15. **Jonker, C.M.**, & Treur, J. (1999). Formal analysis of models for the dynamics of trust based on experiences. In: F. J. Garijo, M. Boman (eds.), *Multi-Agent System Engineering, Proceedings of the 9th European Workshop on Modelling Autonomous Agents in a Multi-Agent World*, MAAMAW'99. *Lecture Notes in Artificial Intelligence*, *1647*, Springer Verlag, Berlin, pp. 221-232. Extended version in: Proceedings of the Agents'99 Workshop on Deception, Fraud and Trust in Agent Societies, pp. 81-94.