

CURRICULUM VITAE

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Mini Biography

Marcus Hutter is Professor in the RSCS at the Australian National University in Canberra, Australia, and NICTA adjunct. He received his PhD and BSc in physics from the LMU in Munich and a Habilitation, MSc, and BSc in informatics from the TU Munich. Since 2000, his research at IDSIA and ANU is centered around the information-theoretic foundations of inductive reasoning and reinforcement learning, which has resulted in 100+ publications and several awards. His book “Universal Artificial Intelligence” (Springer, EATCS, 2005) develops the first sound and complete *theory* of AI. He also runs the Human Knowledge Compression Contest (50'000€ H-prize).

This document contains his detailed hyper-linked curriculum vitae.

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Short Biography

Marcus Hutter is Professor in the Research School of Computer Science (RSCS) at the Australian National University in Canberra, Australia, and Senior Researcher in the National Information and Communication Technology of Australia (NICTA). He is also chair of the ongoing Human Knowledge Compression Contest and sponsor of the 50'000€ H-prize. He received a Masters degree in computer science in 1992 from the University of Technology in Munich, Germany, a PhD in theoretical particle physics in 1996, and completed his Habilitation in 2003. He worked as an active software developer for various companies in several areas for many years, before he commenced his academic career in 2000 at the Artificial Intelligence (AI) institute IDSIA in Lugano, Switzerland, where he stayed for six years. His first large project to receive national attention was a complete 3D CAD program for 8 bit computers in Assembler, which he developed during his final year at high school. In his five years in industry, he developed various algorithms for a medical software company, which are still used in equipment sold world-wide. Since 2000, he has mainly worked on fundamental questions in AI resulting in over 80 peer-reviewed research publications. His book “Universal Artificial Intelligence” (Springer, EATCS, 2005) lays down the information-theoretic foundations of inductive reasoning and reinforcement learning, and develops the first sound and complete *theory* of AI. This work has been generously supported by various (mostly Swiss) research grants. His general interests are in universal artificial intelligence, theories of everything, statistics, philosophy of science, and mathematical and physical puzzles. His current research is centered around reinforcement learning, algorithmic information theory and statistics, universal induction schemes, adaptive control theory, and related areas. He has served (as PC member, chair, organizer) for numerous conferences, and reviews for all major conferences and journals in his research areas. He has given invited lectures at numerous universities, institutions, conferences, workshops, and companies, as well as public presentations and interviews. In 2008 he received the Lindley prize for innovative research in Bayesian Statistics, and was the 1st runner up for the 2009 Kurzweil Prize for the best AGI Paper.

Experience

Main Interests: Universal Artificial Intelligence, Physical Theory of Everything, Mathematical and Physical Puzzles, Statistics, Theoretical Computer Science, Numerical Algorithms, Computer Vision&Graphics, Analytic Philosophy.

Artificial Intelligence: reinforcement/machine learning, algorithmic complexity, optimization, game theory, genetic algorithms, neural nets, Bayesian/robust/expert/MDL/online/sequence prediction.

Engineering:	information theory, adaptive control, time-series forecasting, electronics.
Physics:	non-perturbative quantum field theory, QCD, solitons and instantons, statistical physics, path integrals, anomaly, quark and meson masses, string and brane theory.
Medical:	PencilBeam dose algorithm for radiotherapy and IMRT, Brachytherapy, CT/MT imaging.
Numerics:	Monte Carlo, simulated annealing, multidimensional optimization, finite elements, 1-3d fft & splines & advanced interpolation.
Computer Graphics:	volume & surface rendering.
Image Processing:	segmentation, smoothing, recognition, 2d-3d registration.
Statistics:	probability, Bayes, model selection, sequential decisions.
Mathematics:	discrete math, logic, algebra, analysis.
Programming Languages:	C++, Pascal, Prolog, Fortran, DBase, Forth, Lisp, Basic, Assembler, Html.

Professional Career

since 2011	Full Professor in the Research School of Computer Science (RSCS) at the Australian National University (ANU).
2006 - 2010	Associate Professor in the Research School of Information Sciences and Engineering (RSISE) at the Australian National University (ANU) and senior researcher in the National Information and Communication Technology of Australia (NICTA).
2003/2004	Lecturer at Munich University of Technology, Germany
10.2000 - 2006	Senior researcher and project leader at IDSIA (Research Institute for Artificial Intelligence) in Lugano, Switzerland,

- 05.1996 - 09.2000 Software developer and project leader at BrainLAB:
(Occupation: Numerical algorithms in medical field)
Development of a Neuro-Navigation system, a Brachytherapy planning system, a dose algorithm (PencilBeam) for radiotherapy for IMRT, a real time software volume renderer, and various image processing modules. Invention of a new image enhancement and post-antialiasing algorithm (patented). Supervision of Diploma theses in computer science, ...
- 08.1992 - 04.1993 Design & implementation of a protection module+organization for licensing programs in C (IABG)
- 06.1987 - 10.1987 Implementation of a user interface for an expert system - under GEM (IABG)
- 02.1986 - 01.1987 Design & implementation of a 3D-CAD-Program in Assembler (Markt & Technik)
- 03.1983 - 06.1983 Programming of a member organization program in DBase (for tax advisor Keller)
- 1988 - 1994 Private tuition of high school and university students.

Academic Qualifications

- 2001 - 2003 Habilitation (\approx 2nd PhD) in Computer Science at TU-Munich on Optimal Sequential Decisions based on Algorithmic Probability
Supervisor: Prof. Wilfried Brauer.
- 1993 - 1996 PhD (Dr.rer.nat.) in Theoretical Particle Physics on Instantons in QCD at the University (LMU) in Munich. Supervisor: Prof. H. Fritsch.
- 1989 - 1992 Masters Degree (Dipl.inform.univ) in Computer Science with Minors in Mathematics at the University of Technology in Munich.
- 1988 - 1991 Bachelor (Vordiplom) in General Physics at the University of Technology in Munich.
- 1987 - 1989 Bachelor (Vordiplom) in Computer Science with Minors in Mathematics.

Grants, Prizes, Awards, Honors

- 2009 - 2011 A\$ 240'000,- *Australian Research Council DP grant*. Sole CI.
From Universal Induction to Intelligent Agents (UAI)
- 2008 - 2012 A\$ 270'000,- *Industrial research grant*. Sole PI.
Image-based Car Damage Detection (ICAR)
- 2009 1st runner up of the *Kurzweil Best AGI Paper Prize*
for paper [P09phimdp]: Feature Markov Decision Processes.
- 2007 *Lindley Prize* awarded for innovative research in Bayesian Statistics.
Best paper [P07pcreg, P07pcregx] from 326 submissions to ISBA
Valencia 8.
- 2006 - 2008 SFr 92'730,- *Swiss National Science Foundation grant*. (shared)
A Bayesian approach for integrated cancer genome profiling (BIG)
- 2005 - 2007 SFr 248'772,- *Swiss National Science Foundation grant*. Sole PI
Optimal rational AIXI agent based on algorithmic complexity (AIXI)
- 2003 - 2005 SFr 273'616,- *Swiss National Science Foundation grant*. Sole PI
Optimal rational agents in unknown environments (ORAUE)
- 2001 - 2003 SFr 193'680,- *Swiss National Science Foundation grant*. Unification of
universal inductive inference and sequential decision theory (UISD)

Community Service

(Co)organization

- European Workshop on Reinforcement Learning (EWRL 2011), Chair.
- Weekly Readings Groups at ANU (AI&RL&KC 2009–2011)
- Algorithmic Learning Theory in Canberra (ALT 2010), General Chair
- Machine Learning Summer School in Canberra (MLSS 2010)
- Artificial General Intelligence in Lugano (AGI 2010), Conference Chair
- Partially Observable Reinforcement Learning Symposium in Vancouver (PORL 2009)
- Machine Learning Summer School in Kioloa (MLSS 2008)
- Kolmogorov Complexity Seminar in Dagstuhl (KC 2006)
- Weekly Theory Reading Group at IDSIA in Lugano (TRG 2004–2005)
- Universal Learning & Optimal Search Workshop at NIPS (ULAOS 2002)

Conference program committee chair

- 2nd Artificial General Intelligence in Washington (AGI 2009)
- 18th Algorithmic Learning Theory in Sendai (ALT 2007)

Membership of conference program committees

- The 8th Conference on Computability in Europe (CiE 2012), Turing Centenary Conference, Cambridge, UK.
- Ray Solomonoff (1926-2009) 85th Memorial Conference (SMC 2011), Melbourne, Australia.
- 22nd European Conference on Machine Learning (ECML 2011), Athens, Greece.
- The 4th Conference on Artificial General Intelligence (AGI 2011), Mountain View, California, USA.
- The 22nd International Joint Conference on Artificial Intelligence (IJCAI 2011), Barcelona, Spain.
- The 28th International Conference on Machine Learning (ICML 2011), Bellevue, Washington, USA.
- The 25&26th Conference on Uncertainty in Artificial Intelligence (UAI 2009 & 2010)
- The 21&23rd Australasian Joint Conference on Artificial Intelligence (AusAI 2008 & 2010)
- The 1st Conference on Artificial General Intelligence (AGI 2008), University of Memphis, USA.
- The 8th biannual International Conference on Artificial Intelligence & Statistics (AISTATS 2007), San Juan, Puerto Rico.
- The 17&19th International Conference on Algorithmic Learning Theory (ALT 2006 & 2008)
- The 18&20th Annual Conference on Learning Theory (COLT 2005 & 2007)
- Annual Machine Learning Conference of Belgium and The Netherlands (Benelearn 2002 & 2004 & 2005 & 2006)

Miscellaneous service

- Founding board member of the AGI Society (since 2011)
- Steering Committee Chair of the European Workshop for Reinforcement Learning (EWRL) Series (since 2011).
- Member of the Editorial Board of the Machine Learning Journal (2011–2014)
- Member of the CASS@ANU Search/Selection Committee (2011)
- Editor of the Journal of Artificial General Intelligence (since 2009).
- Member of the CECS@ANU Advisory board (2008)
- Member of the CECS@ANU Promotions' Committee (2008)
- Steering committee member of the AGI conference series (since 2008)
- Second Editor of Scholarpedia (since 2007)
- Examiner of a couple of PhD theses (since 2007)
- Chair and sponsor of the 50'000€ Prize for Compressing Human Knowledge (since 2006)

- Expert assessor for the Australian Research Council (ARC) (since 2003).
- Moderator of the Algorithmic Information Theory mailing list (since 2002).
- Reviewer of journals (since 2002) IEEE (TPAMI, TIT, TSP, SMC, TEC), Elsevier (TCS, I&C, JCSS, IPL, IJAR, SIMPAT), Springer (MLJ, Algorithmica, M&M, ToCS, Synthese), Others (JACM, JMLR, JAIR, JBSB, FI, SS, Entropy, ...).
- Reviewer of conferences (since 2001) STACS, NIPS, COLT, ALT, ICANN, CATS, Benelearn, ACC, ...

Outreach / Interviews / Press

Public outreach

- Foundations of Intelligent Agents. *Singularity Summit (2009), New York (Invited public lecture. About 800 participants)*
- On Science, Fiction, and Future Reality. *Guest lecture to high-school students at The American School of Switzerland (TASIS 2005 & 2006), Lugano.*

Interviews

- New Scientist Magazine. Universal intelligence: One test to rule them all. *(13 Sep 2010, Issue#2829, p42-45) Celeste Biever interviewing Hernandez-Orallo and Marcus Hutter and others.*
- SoundProof: Woroni's Podcast Experiment. *AI Part I (3 June 2010) and AI Part II (10 June 2010). Jamie Freestone and Mathew McGann interviewing Marcus Hutter and David Chalmers.*
- ABC Radio National. All In the Mind. The coming of 'The Singularity'...or not? *(19 September 2009) 13:00-13:30. Mike McRae interviewing Nick Bostrom, Marcus Hutter, Noel Sharkey, Nigel Dobson-Keeffe, and Richard K. Morgan.*
- L'Eretico - idee arte pensiero. Filosofia e Scienza. Le Frontiere Dell'Intelligenza. *Daniele Lanzillo interviewing Marcus Hutter (July 2009)*

Press coverage

- That 'theory of everything'? A researcher says it has a lot going for it (2010) *Work [P10ctoex] featured in Medill Reports Chicago (8 Oct 2010).*
- 50'000€ Prize for Compressing Human Knowledge (2006) *Discussion in the Hutter-Prize mailing list, Yahoo group ai-philosophy, news net groups comp.ai.nat-lang, comp.compression, comp.ai, at Slashdot, in the Online Heise news, KurzweilAI.net news, Accelerating Future page, ebiquity news, AGI mailing list, and many others.*

- Measuring the Intelligence of a Machine (2005)
Work [P05iors] featured in Le Monde de l'intelligence (No.1, Nov/Dec.2005)
Also commented on in NewScientist Magazine (13.Aug'05,p27#2512)
(Spot the Bots with Brains).
- Universal Artificial Intelligence: Sequential Decisions based on Algorithmic Probability (2005)
Reviews of book [P05uaibook]: ACM Reviews (27.Apr 2005,#CR131175),
Artificial Intelligence Journal (2006), amazon.com (2004-2008)
- Intelligent Machines that Learn Unaided (2004)
Ticino Ricerca, Project of the month 9 (2004)
- Diversity Trumps Fitness (2001)
Paper [P02fuss] featured in the Technology Research News Magazine (2001)
- About Infinity in Computer Science (2001)
Paper [P02fast] featured in SuperEva
- Universal Artificial Intelligence based on Algorithmic Probability (2001)
Paper [P01aixi] intensely discussed in the AGI mailing list (2002, 2003-2006)
and also in the commp.ai.philosophy newsgroup and ai-philosophy Yahoo
group (2005-2006).

Lecturing

Full & Shared Courses for Students

- AI&RL&KC Reading Groups
Every Wednesday 10:00-12:30 (2009-2011), ANU, Organizer
- Foundations of Artificial Intelligence
Winter Semester (2010) ANU, Canberra, Lectures
- Reinforcement Learning and Planning under Uncertainty
Winter Semester (2008) NICTA & ANU, Canberra, Lectures
- Introduction to Artificial Intelligence
Summer Semester (2007&2008&2009&2010&2011) ANU, Canberra, Lectures
- Introduction to Statistical Machine Learning
Summer Semester (2007&2008) NICTA & ANU, Canberra, Lectures
- Combinatorics and Probability
Winter Semester (2006) Australian National University, Canberra, Lectures
- Universal Artificial Intelligence: Math. and Phil. Foundations
Helsinki Graduate School in CS&E (HeCSE 2006), Helsinki, Lectures
- Theory Reading Group
Every Wednesday 15:00-16:30 (2004-2005), IDSIA, Organizer
- Algorithmic Information Theory and Machine Learning
Winter Semester (2003), University of Technology Munich, Lectures
- Quantum Electro Dynamics
Summer Semester (1995), LM-University Munich, Chief Tutor

- Theoretical Mechanics
Winter Semester (1993), LM-University Munich, Tutor

Short Tutorials for Students

- Foundations of Machine Learning [slides,video]
Machine Learning Summer School (2008), ANU/RSISE/NICTA, Tutorial
- Introduction to Statistical Machine Learning [slides,video]
Machine Learning Summer School (2008&2009&2010), ANU/RSISE/NICTA, Tutorial
- Foundations of Intelligent Agents
First Summer School (ACISS'09) at AusAI Conference (2009) Melbourne, Tutorial
- Universal Artificial Intelligence [slides,video]
Conf. on Artificial General Intelligence (2010), Lugano, Tutorial
Summer Schools of Logic & Learning (2009), ANU/RSISE/NICTA Canberra, Lecture
- On the Philosophical, Statistical, and Computational Foundations of Inductive Inference and Intelligent Agents
International Conference on Algorithmic Information Theory (2007), Sendai, Tutorial
- How to Predict with Bayes, MDL, and Experts [slides,video]
International Conf. on Machine Learning (2005), Bonn, Tutorial
Machine Learning Summer School (2005), ANU/RSISE/NICTA Canberra, Lectures

Invited Lectures at Conferences & Workshops

- Formalizing Intelligence and the Human Knowledge Compression Prize
JTF Workshop on the Foundational Questions in the Mathematical Sciences (2011), Traunkirchen, Austria
- Foundations of Intelligent Agents [slides,video]
Singularity Summit (2009), New York
- Foundations of Rational Agents
Second International Symposium on Practical Cognitive Agents and Robots (PCAR 2008), University of Technology, Sydney
- The Fastest and Shortest Algorithm for All Well-Defined Problems
5th Turing Days Conference on Randomness and Complexity (2006), Bilgi University, Istanbul
- On the Foundations of Universal Sequence Prediction
Symposium on Theory and Applications of Models of Computation (TAMC-2006), Learning Theory Session, Beijing
- Universal Artificial Intelligence [slides,video]

Workshop Toward a Serious Computational Science of Intelligence (SCSI@AGI 2010), Lugano

Swiss Mathematical Society, Fall Meeting (SMS 2005), Lugano

- Theoretically Optimal Program Induction and Universal Artificial Intelligence
Inductive Programming Workshop W1 at (ICML-2005), Bonn
- MDL Predictions based on Kolmogorov Complexity
Centennial Seminar on Kolmogorov Complexity and Applications (2003), Dagstuhl
- On the Existence and Convergence of Universal Priors
Workshop on Computability and Randomness (2003), Uni-Heidelberg
- Solomonoff Induction and the Foundations of Occam's, Epicurus', Bayes', and Utility Principles
Workshop on Foundations of Occam's razor (NIPS-2001), Vancouver
- An effective Procedure for Speeding up Algorithms
Conference on Mathematical Approaches to Biological Computation (MaBiC-2001), Lavin
Workshop on Algorithmic Information Theory (TAI-2001), Porquerolles
- Universal Sequential Decisions in Unknown Environments
Workshop on Universal Learning Algorithms and Optimal Search (NIPS-2002), Vancouver
5th European Workshop on Reinforcement Learning (EWRL-2001), Utrecht

Talks at Conferences

- Ray Solomonoff's Legacy [video]
Conference on Artificial General Intelligence (2010), Lugano
- Observer Localization in Multiverse Theories
Conference in Honor of Murray Gell-Mann's 80th Birthday (CMGM80-2010), Singapore
- Principled Large-Scale POMDP Learning
Symposium on Partially Observable Reinforcement Learning (PORL-2009) at NIPS, Vancouver
- Feature Markov Decision Processes [video]
2nd Conf. on Artificial General Intelligence (AGI-2009), Arlington
- Feature Dynamic Bayesian Networks
2nd Conf. on Artificial General Intelligence (AGI-2009), Washington
- The Loss Rank Principle for Model Selection
20th Annual Conf. on Learning Theory (COLT-2007), San Diego
- General Discounting versus Average Reward
16th International Conf. on Algorithmic Learning Theory (ALT-2006), Barcelona
- Universal Learning of Repeated Matrix Games

Annual Machine Learning Conference of Belgium and The Netherlands (Benelearn-2006), Ghent

- Fast Non-Parametric Bayesian Inference on Infinite Trees
15th International Conference on Artificial Intelligence and Statistics (AISTATS-2005), Barbados
- Universal Convergence of Semimeasures on Individual Random Sequences
15th International Conf. on Algorithmic Learning Theory (ALT-2004), Padova
Kolmogorov Complexity and Applications (Dagstuhl-2006), Germany
- Prediction with Expert Advice by Following the Perturbed Leader for General Weights
15th International Conf. on Algorithmic Learning Theory (ALT-2004), Padova
- Online Prediction - Bayes versus Experts
EU PASCAL Workshop (LTBIP-2004), London
- Self-Optimizing and Pareto-Optimal Policies in General Environments based on Bayes-Mixtures
15th Annual Conference on Computational Learning Theory (COLT-2002), Sydney
- Fitness Uniform Selection to Preserve Genetic Diversity
Congress on Evolutionary Computation (CEC-2002), Honolulu
Conference of the European Chapter on Combinatorial Optimization (ECCO-2002), Lugano
- Distribution of Mutual Information
14th Conference on Neural Information Processing Systems (NIPS-2001), Vancouver
- General Loss Bounds for Universal Sequence Prediction
18th International Conference on Machine Learning (ICML-2001), Williamstown
- Towards a Universal Theory of Artificial Intelligence based on Algorithmic Probability and Sequential Decisions
12th European Conference on Machine Learning (ECML-2001), Freiburg
- Convergence and Error Bounds for Universal Prediction of Nonbinary Sequences
12th European Conference on Machine Learning (ECML-2001), Freiburg

(Invited) Talks at Universities

(often accompanied by a short research visit for a couple of days)

- Universal Bayesian Agents: Theory and Applications
University of Cambridge (UC 2011), Cambridge
- Universal Artificial Intelligence
CSIT Monash University (2010), Melbourne

- Foundations of Intelligent Systems
Swiss Federal Institute of Technology Zurich (ML@ETH 2011), Zürich
Max Planck Institute for Intelligent Systems (MPI 2011), Stuttgart
RMIT University (2010), Melbourne
- Predictive Hypothesis Identification
National University of Singapore (COMP@NUS 2010), Singapore
- Learning to Predict with MDL & Bayes
National University of Singapore (DSAP@NUS 2010), Singapore
- Introduction to and Applications of Algorithmic Information Theory
Australian National University (MSI@ANU 2009), Australia
- Generic Reinforcement Learning Agents
University of Technology, Sydney (UTS 2010), Sydney
California Institute of Technology (CALTECH 2009), Pasadena (Los Angeles)
Max Planck Institute for Biological Cybernetics (MPI 2009), Tübingen
Swiss Federal Institute of Technology Zurich (ETHZ 2009), Zürich
University of Technology (TUM 2009), Munich
Dalle Molle Institute for Artificial Intelligence (IDSIA 2009), Lugano
University of New South Wales (UNSW 2009), Sydney
- On Universal Induction and Intelligent Agents
Australian National University (MSI 2010 and RSSS 2008), Australia
- Bayes-Optimal Policies in General Environments
University of Alberta (UA 2007), Edmonton
- On the Philosophical, Statistical, and Computational Foundation of Inductive Inference
University of Queensland (UQLD 2008), Brisbane
University of Alberta (UA 2007), Edmonton
- On Universal Prediction and Bayesian Confirmation
Swiss Federal Institute of Technology Zurich (ETHZ 2006), Zurich
- Bayesian PC-Regression for Detecting Aberrations in DNA of Cancer Cells
Swiss Federal Institute of Technology Zurich (ETHZ 2006), Zurich
Dalle Molle Institute for Artificial Intelligence (IDSIA 2005), Lugano
- Bayesian and Universal Induction
Swiss Federal Institute of Technology Zurich (ETHZ 2006), Zurich
- Universal Prediction: Concepts, Tools and Applications
Oncology Institute of Southern Switzerland & Dalle Molle Institute for Artificial Intelligence (IOSI/IDSIA 2005), Lugano
- Foundations of Machine Learning = Information + Decision Theory
University of Alberta (UA 2007), Edmonton
Australian National University (ANU 2005), Canberra
- Fast/Exact Non-Parametric Bayesian Inference on Infinite Trees
Queensland University of Technology (QUT 2010), Brisbane.
University of Sydney (USYD 2005), Sydney

- Optimal Sequential Decisions Based on Algorithmic Probability
Swiss Federal Institute of Technology Zurich (ETHZ 2004), Zurich
California Institute of Technology (CALTECH 2003), Pasadena (Los Angeles)
- Bayesian Mutual Information and Robust Feature Selection
Ludwig-Maximilian University Munich (LMU 2004), Munich
- MDL Predictions based on Kolmogorov Complexity
Boston University (BU 2003), Boston
- Towards a Universal Theory of Artificial Intelligence based on Algorithmic Probability and Sequential Decisions
Workshop on Universal Learning Algorithms and Optimal Search (NIPS-2002), Vancouver
University of Queensland (UQLD 2002), Brisbane
Monash University (2002), Melbourne
University of New South Wales (UNSW 2002), Sydney
Australian National University (ANU 2002), Canberra
Boston University (BU 2002), Boston
Centrum voor Wiskunde en Informatica (CWI 2002), Amsterdam
- The Fastest and Shortest Algorithm for All Well-Defined Problems
University of New South Wales (UNSW 2005), Sydney
California Institute of Technology (CALTECH 2003), Pasadena (Los Angeles)
Centrum voor Wiskunde en Informatica (CWI 2001), Amsterdam
- New Error Bounds for Solomonoff Prediction
University of Technology Munich (TUM 2000), Munich
- A Theory of Universal Artificial Intelligence based on Algorithmic Complexity
Istituto Dalle Molle di Studi sull'Intelligenza Artificiale (IDSIA 2000), Lugano
University of Technology (TUM 2000), Munich
- Instantons in QCD: Theory and Application of the Instanton Liquid Model
University of Tel Aviv (1995), Tel Aviv
- Instantons and Meson Correlators in QCD
CERN (1995), Geneva

Poster Presentations

- Discrete MDL Predicts in Total Variation
23rd Conference on Neural Information Processing Systems (NIPS 2009), Vancouver
- An Improved Bayesian Method for DNA Copy Number Estimation
9th ISBA World Meeting (ISBA 2008), Hamilton Island
- Universal Bayesian Solution to the Induction Problem

- *9th ISBA World Meeting (ISBA 2008), Hamilton Island*
- Temporal Difference Updating without a Learning Rate
21st Conference on Neural Information Processing Systems (NIPS 2007), Vancouver
- Bayesian Regression of Piecewise Constant Functions
ISBA 8th International Meeting on Bayesian Statistics (ISBA 2006), Benidorm
- Sequence Prediction based on Monotone Complexity
16th Annual Conf. on Learning Theory (COLT 2003), Washington, DC

More Lectures

- On Science, Fiction, and Future Reality
The American School of Switzerland (TASIS 2005 & 2006), Lugano
- Various Lectures in the Theory Reading Group
Dalle Molle Institute for Artificial Intelligence (IDSIA 2004-2005), Lugano
- The Pencil Beam Algorithm in RadioTherapy
Company BrainLAB (1999-2000), Munich
- Parallel Algorithms in Fluid Mechanics
Ferienakademie, TU-München, Infomatik (1991), Maria Laach
- Various other lectures at employed places
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Past & Current Group Members

Past and current PostDocs

- 2009 - 2012 Peter Sunehag - *From Universal Induction to Intelligent Systems*, RSISE/ANU/NICTA
- 2008 - 2009 Rakib Ahmed - *Image-based Car Damage Detection*, RSISE@ANU
- 2005 - 2007 Daniil Ryabko - *Optimal Rational AIXI Agent based on Algorithmic Complexity*, IDSIA
- 2003 - 2005 Jan Poland - *Optimal Rational Agents in Unknown Environments*, IDSIA

Past and current PhD students

- 2011 - 2014 Wen Shao - *Universal Artificial Intelligence*, RSCS@ANU
- 2011 - 2014 Mayank Daswani - *Feature Dynamic Bayesian Networks*, RSCS@ANU
- 2010 - 2014 Di Yang - *Image-based Car Damage Detection*, RSISE@ANU

2010 - 2013 Tor Lattimore - *Foundations of Reinforcement Learning*,
RSISE@ANU
 2009 - 2012 Phuong Nguyen - *Generic Reinforcement Learning Agents*,
RSISE@ANU
 2009 - 2012 Srimal Jayawardena - *Image-based Car Damage Detection*,
RSISE@ANU
 2009 - 2011 Matthew Robards - *Continuous-State Reinforcement Learning*,
NICTA&ANU
 2009 - 2011 Joel Veness - *Approximate Universal AI and Games*, UNSW
 2009 - 2010 Ian Wood - *Information-Theoretic Foundations of Inductive
Reasoning*, DCS@ANU
 2008 - 2011 Nathan Brewer - *Image Processing and Computer Vision*,
RSISE/ANU/NICTA
 2006 - 2010 Paola Rancoita - *Bayesian Integrative Genomics*, IDSIA/IOSI
 2003 - 2007 Shane Legg - *Machine Super Intelligence*, IDSIA (SIAI Award)

Past and current Master's students

2008/9 Ke Zhang, RSISE/ANU/NICTA, *Outlier Detection*
 2007 Nathan Brewer, RSISE@ANU, *Dynamic Bayesian Networks*
 2001 Daniele Pongan, ETHZ/IDSIA, *Evolutionary Algorithms - FUSS*
 SS 1998 Hannes Mahlknecht, BrainLAB, *Voxel/Surface-Library*
 WS 1997/8 Andreas Bertagnoll, BrainLAB, *Voxel/Surface-Library*
 1994/5 Michael Birkel, LMU, *Particle physics*

Past and current other students (honors or interns or project)

2011 Daniel Visentin, Honors, PhB@ANU, *FRL*
 2010/11 Jan Melchior, Intern from CE, SoCS@ANU, *ICAR*
 2010 Daniel Visentin, Project, PhB@ANU, *MC-AIXI-CTW*
 2010 Alexander O'Neill, Honors, SoCS@ANU, *CTW*
 2010 Samuel Rathmanner, Honors, SoCS@ANU, *USP*
 2009/10 Rachel Bunder, Intern @ ANU from Uni Wollongong, *PACMDP*
 2009/10 Mayank Daswani, Intern, CSL@ANU, *PACMDP*
 2009 Tor Lattimore, Honors, MSI@ANU, *KC&UI*
 2008 Tor Lattimore, Project, FEIT@ANU, *UI&NFL*
 2007 Kassel Hingee, Project, MSI@ANU, *SELECT*
 2007 Minh Ngoc Tran, Intern, Vietnam student @ NICTA, *LORP*
 2007 Tiago da Silva, Intern, Brazilian student @ NICTA, *GAME*
 2004 Akshat Kumar, Project, Indian Institute of Technology Guwahati,
FUSS

Publications

Most articles are available online at <http://www.hutter1.net/>. Generally accessible articles are marked with ^o. Some key publications are highlighted by a *. They include a book [P05uaibook], with recent applications [P11aixictwx], my physics [P97family] and AI [P01aixi] ideas I'm most proud of, my most popular paper [P02fast], a rather technical paper [P03spupper], a patent [P02uspatent], and my first publication [P87cad]. Publications in top conferences in (theoretical) computer science are of equal rank to journal publications. For a comprehensive list of Conference and Journal reputations see e.g. http://www.arc.gov.au/era/era_journal_list.htm.

Monographs and Edited Books

- [P10altproc] M. Hutter, F. Stephan, V. Vovk, and T. Zeugmann, editors. *Algorithmic Learning Theory*, volume 6331 of *LNAI*, Canberra, 2010. Springer.
- [P10agiproc] E. Baum, M. Hutter, and E. Kitzelmann, editors. *Artificial General Intelligence*. Atlantis Press, Lugano, 2010.
- [P09alttcs] M. Hutter and R. A. Servedio, editors. ALT'07 special issue. *Theoretical Computer Science*, 410(19):1747–1748/1912, 2009.
- [P09agiproc] B. Goertzel, P. Hitzler, and M. Hutter, editors. *Artificial General Intelligence*. Atlantis Press, Arlington, 2009.
- [P07altproc] M. Hutter, R. A. Servedio, and E. Takimoto, editors. *Algorithmic Learning Theory*, volume 4754 of *LNAI*, Sendai, 2007. Springer.
- [P05uaibook]* M. Hutter. *Universal Artificial Intelligence: Sequential Decisions based on Algorithmic Probability*. 300 pages. Springer, Berlin, 2005.
<http://www.hutter1.net/ai/uaibook.htm>.

Journal papers

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