Work Address
Institute of Science and Technology (IST), Austria
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Home Address
Institute of Science and Technology (IST), Austria
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Krishnendu Chatterjee

Homepage: http://pub.ist.ac.at/∼kchatterjee

Personal Information

Year of Birth: 1978
Nationality: Indian

Education

- *Doctorate (PhD) in Computer Science* (Dec 2007)
  University of California, Berkeley.
- *MS in Computer Science* (May 2004)
  University of California, Berkeley
- *Bachelor of Technology (B.Tech (Hons.))* -Computer Science and Engineering,
  Indian Institute of Technology (IIT) - Kharagpur, India.
- *Higher Secondary Education : St. Xaviers College*, Calcutta,India
- *Secondary Education : Orient Day School*, Calcutta, India

Research Interests

- Verification and control of reactive systems.
- Probabilistic model checking.
- Stochastic game theory.
- Application of formal methods and games for reliable systems.
- Game theory in logic, automata theory and verification.
- Reputation and trust management system for Wikipedia.

PhD Thesis

- *"Stochastic ω-Regular Games"* under the supervision of Prof.Thomas A. Henzinger, at UC, Berkeley (thesis defended in 2007). The Thesis won the David J. Sakrison award from UC Berkeley for outstanding research, and Ackermann award from EACSL for outstanding dissertation in computer science logic.

Academic Employment

- Assistant Professor at Institute of Science and Technology, Austria. (from June 2009–present)
- Post-doctoral Researcher with Prof. Luca de Alfaro at UC, Santa Cruz. (from Feb 2008–to May 2009).

Academic Awards and Honors

1. **Ackermann Award** in 2008 for PhD Thesis awarded by European Association of Computer Science Logic (EACSL) for "Outstanding Dissertation Award for Logic in Computer Science", 2008.
2. **David J. Sakrison Memorial Prize** for PhD Thesis (awarded annually for a "truly outstanding and innovative piece of research documented in written form"), University of California, Berkeley, 2008.

3. **President of India Gold Medal** (most prestigious academic award in IIT) in the batch of 2001 for being the best student *in order of merit* among students of all B.Tech(Hons) and B.Arch courses in *IIT,Kharagpur*.
4. *Institute Silver Medal* for the academic year 2000-2001 for being adjudged the *best student* in order of merit among students graduating with B.Tech(Hons). degree in Computer Science and Engineering.

Professional Activities

PC Member

1. FOSSACS 2010.
2. LICS 2010
3. CSL 2010.
4. GANDALF 2010.
5. FOSSACS 2011.

PC Chair

1. FORMATS 2010.
2. GPMFV Workshop 2010.

Conference and Workshop Organization

1. FORMATS 2010.
2. GPMFV Workshop 2010.

Publications

Conferences and Workshops

1. *Faster and Dynamic Algorithms For Maximal End-Component Decomposition And Related Graph Problems In Probabilistic Verification*
   Krishnendu Chatterjee and Monika Henzinger
   SODA 11
2. *Generalizaed Mean-payoff and Energy Games*
   Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger and Jean-Francois Raskin
   FSTTCS 10
3. *FORMATS 2010*
   Krishnendu Chatterjee and Thomas A. Henzinger (Editors)
4. *The Complexity of Partial-Observation Parity Games*
   Krishnendu Chatterjee and Laurent Doyen
   LPAR-17 2010
5. *Probabilistic Automata on Infinite Words: Decidability and Undecidability Results*
   Krishnendu Chatterjee and Thomas A. Henzinger
   ATVA 10
6. *Randomness for Free*
   Krishnendu Chatterjee, Laurent Doyen, Hugo Gimbert and Thomas A. Henzinger
   MFCS 10
7. *Qualitative Analysis of Partially-Observable Markov Decision Processes*
   Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
   MFCS 10

8. *Obligingness Games*
   Krishnendu Chatterjee, Florian Horn and Christof Loeding
   CONCUR 10
9. *Mean-payoff Automaton Expressions*
   Krishnendu Chatterjee, Laurent Doyen, Herbert Edelsbrunner, Thomas A. Henzinger and Phillipe Rannou
   CONCUR 10
10. *Discounting in Games across Time Scales*
    Krishnendu Chatterjee and Rupak Majumdar
    GandALF 10
11. *Energy Parity Games*
    Krishnendu Chatterjee and Laurent Doyen
    ICALP 10
12. *Measuring and Synthesizing Systems in Probabilistic Environments*
    Krishnendu Chatterjee, Thomas A. Henzinger, Barbara Jobstmann and Rohit Singh
    CAV 10
13. *Gist: A Solver for Probabilistic Games*
    Krishnendu Chatterjee, Thomas A. Henzinger, Barbara Jobstmann and Arjun Radhakrishna
    CAV 10
14. *Robustness in the Presence of Liveness*
    Roderick Bloem, Krishnendu Chatterjee, Karin Greimel, Thomas A. Henzinger and Barbara Jobstmann
    CAV 10
15. *Analyzing the Impact of Change in Multi-threaded Programs*
    Krishnendu Chatterjee, Luca de Alfaro, Vishwanath Raman and Cesar Sanchez
    FASE 10
16. *Probabilistic Weighted Automata*
    Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
    Proceedings of 19th International Conference on Concurrency Theory (Concur 09)
17. *Better Quality in Synthesis through Quantitative Objectives*
    Roderick Bloem, Krishnendu Chatterjee, Thomas A. Henzinger and Barbara Jobstmann
    Proceedings of Computer Aided Verification (CAV 09)
18. *A Survey of Stochastic Games with Limsup and Liminf Objectives*
    Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
    Proceedings of ICALP 09
19. *Alternating Weighted Automata*
    Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
    Proceedings of Fundamentals of Computation Theory (FCT 09)
20. *Stochastic Games with Finitary Objectives*
    Krishnendu Chatterjee, Thomas A. Henzinger and Florian Horn
    Proceedings of MFCS 09
21. *Expressiveness and Closure Properties for Quantitative Languages*
    Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
    Proceedings of the 24th Annual Symposium on Logic in Computer Science (LICS-09)
22. *Alpaga: A Tool for Solving Parity Games with Imperfect Information*
    Dietmar Berwanger, Krishnendu Chatterjee, Martin de Wulf, Laurent Doyen and Thomas A. Henzinger
    Proceedings of 15th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 09)

23. *Termination Criteria for Solving Concurrent Safety and Reachability Games*
Krishnendu Chatterjee, Luca de Alfaro and Thomas A. Henzinger
Proceedings of 20th ACM-SIAM Annual Symposium on Discrete Algorithm (SODA-09)

24. *Algorithms for Game Metrics*
Krishnendu Chatterjee, Luca de Alfaro, Rupak Majumdar and Vishwanath Raman
Proceedings of the 28th Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 08)

25. *The Complexity of Coverage*
Krishnendu Chatterjee, Luca de Alfaro and Rupak Majumdar
APLAS 2008

26. *Probabilistic Systems with LimSup and LimInf Objectives*
Krishnendu Chatterjee and Thomas A. Henzinger
ILC 2008

27. *Robust Content-Driven Reputation*
Krishnendu Chatterjee, Luca de Alfaro and Ian Pye
AISec 2008

28. *Assigning Trust to Wikipedia Content*
Bo T. Adler, Krishnendu Chatterjee, Luca de Alfaro, Marco Faella, Ian Pye and Vishwanath Raman
WikiSym: International Symposium on Wikis, 2008

29. *Timed Games: Complexity and Robustness*
Krishnendu Chatterjee, Thomas A. Henzinger and Vinayak Prabhu
FORMATS 08

30. *Environment Assumptions for Synthesis*
Krishnendu Chatterjee, Thomas A. Henzinger and Barbara Jobstmann
Proceedings of 18th International Conference on Concurrency Theory (Concur 08)

31. *Strategy Construction for Parity Games with Imperfect Information*
Dietmar Berwanger, Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger and Sangram Raje
Proceedings of 18th International Conference on Concurrency Theory (Concur 08)

32. *Quantitative Languages*
Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
Proceedings of the 17th Annual Conference of the European Association for Computer Science Logic (CSL-08)

33. *Trading Infinite Memory with Uniform Randomness in Timed Games*
Krishnendu Chatterjee, Thomas A. Henzinger and Vinayak Prabhu
Hybrid Systems: Computation and Control (HSCC 08)

34. *Controller Synthesis with Budget Constraints*
Krishnendu Chatterjee, Rupak Majumdar and Thomas A. Henzinger
Hybrid Systems: Computation and Control (HSCC 08)

35. *Model Checking ω-Regular Properties of Interval Markov Chains*
Krishnendu Chatterjee, Koushik Sen and Thomas A. Henzinger
Foundations of Software Science and Computation Structures (FoSSaCS 08)

36. *Reliability of Interacting Real-time tasks*
Krishnendu Chatterjee, Arkadeb Ghosal, Thomas A. Henzinger, Christoph Kirsch, Alberto Sangiovanni Vincentelli, Claudio Pinello and Daniel Irkan
Design Automation, and Test in Europe (DATE 08)

37. *Value Iteration*
Krishnendu Chatterjee and Thomas A. Henzinger
25 Years in Model Checking

38. *Stochastic Müller Games are PSPACE-complete*
Krishnendu Chatterjee
Proceedings of the 27th Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 07)

39. *Markov Decision Processes with Multiple Long-run Average Objectives*
Krishnendu Chatterjee
Proceedings of the 27th Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 07)

40. *Qualitative Logics and Equivalences for Markov Decision Processes*
Luca de Alfaro, Krishnendu Chatterjee, Marco Faella and Axel Legay
Proceedings of 4th International Conference on Quantitative Evaluation of Systems (QEST-07)

41. *Strategy Logic*
Krishnendu Chatterjee, Thomas A. Henzinger and Nir Piterman
Proceedings of 17th International Conference on Concurrency Theory (Concur 07)

42. *Assume Guarantee Synthesis*
Krishnendu Chatterjee and Thomas A. Henzinger
Proceedings of 13th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 07)

43. *Generalized Parity Games*
Krishnendu Chatterjee, Thomas A. Henzinger and Nir Piterman
Foundations of Software Science and Computation Structures (FoSSaCS 07)

44. *Optimal Strategy Synthesis in Stochastic Müller Games*
Krishnendu Chatterjee
Foundations of Software Science and Computation Structures (FoSSaCS 07)

45. *Algorithms for Büchi Games*
Krishnendu Chatterjee, Thomas A. Henzinger and Nir Piterman
3rd Workshop of Games in Design and Verification (GDV-06)

46. *Algorithms for Omega-Regular Games with Imperfect Information*
Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger and Jean-Francois Raskin
Proceedings of the 15th Annual Conference of the European Association for Computer Science Logic (CSL-06)

47. *Concurrent Games with Tail Objectives*
Krishnendu Chatterjee
Proceedings of the 15th Annual Conference of the European Association for Computer Science Logic (CSL-06)

48. *Nash Equilibrium for Upward-Closed Objectives*
Krishnendu Chatterjee
Proceedings of the 15th Annual Conference of the European Association for Computer Science Logic (CSL-06)

49. *Quantitative Compositional Reasoning*
Krishnendu Chatterjee, Luca de Alfaro, Marco Faella, Thomas A. Henzinger, Rupak Majumdar and Marielle Stoelinga
Proceedings of 3rd International Conference on Quantitative Evaluation of Systems (QEST-06)

50. *Strategy Improvement for Concurrent Reachability Games*
Krishnendu Chatterjee, Luca de Alfaro and Thomas A. Henzinger
Proceedings of 3rd International Conference on Quantitative Evaluation of Systems (QEST-06)

51. *Strategy Improvement for Stochastic Rabin and Streett Games*
Krishnendu Chatterjee and Thomas A. Henzinger
Proceedings of 17th International Conference on Concurrency Theory (Concur 06)

52. *Games for Controls*
Krishnendu Chatterjee, Radha Jagadeesan and Corin Pitcher
Proceedings of 19th IEEE Computer Security Foundations Workshop (CSFW 06)

53. *Finitary Winning in ω-Regular Games*
Krishnendu Chatterjee and Thomas A. Henzinger
Proceedings of 12th International Conference on Tools and Algorithms for the Construction and Analysis of Systems (TACAS 06)

54. *Strategy Improvement and Randomized Subexponential Algorithms for Stochastic Parity Games*
Krishnendu Chatterjee and Thomas A. Henzinger
Proceedings of 23rd Annual Symposium on Theoretical Aspects of Computer Science (STACS 06)

55. *Markov Decision Processes with Multiple Objectives*
Krishnendu Chatterjee, Rupak Majumdar and Thomas A. Henzinger
Proceedings of 23rd Annual Symposium on Theoretical Aspects of Computer Science (STACS 06)

56. *The Complexity of Quantitative Concurrent Parity Games*
Krishnendu Chatterjee, Luca de Alfaro and Thomas A. Henzinger
Proceedings of 17th ACM-SIAM Annual Symposium on Discrete Algorithm (SODA-06)

57. *Semiperfect-Information Games*
Krishnendu Chatterjee and Thomas A. Henzinger
Proceedings of the 25th Conference on Foundations of Software Technology and Theoretical Computer Science (FSTTCS 05)

58. *Verifying Quantitative Properties using Bound Functions*
Arindam Chakrabarti, Krishnendu Chatterjee, Thomas A. Henzinger, Orna Kupferman and Rupak Majumdar
Proceedings of the 13th Advanced Research Working Conference on Correct Hardware Design and Verfication Methods (CHARME 05)

59. *Two-player Nonzero-sum ω-regular Games*
Krishnendu Chatterjee
Proceedings of 16th International Conference on Concurrency Theory (Concur 05)

60. *Counterexample-guided Planning*
Krishnendu Chatterjee, Thomas A. Henzinger, Ranjit Jhala and Rupak Majumdar
Proceedings of 21st International Conference on Uncertainty in Artificial Intelligence (UAI 05)

61. *The Complexity of Stochastic Rabin and Streett Games*
Krishnendu Chatterjee, Luca de Alfaro and Thomas A. Henzinger
Proceedings of the 32nd International Colloquium on Automata, Languages and Programming (ICALP-05)

62. *Mean-payoff Parity Games*
Krishnendu Chatterjee,Thomas A. Henzinger and Marcin Jurdziński
Proceedings of the 20th Annual Symposium on Logic in Computer Science (LICS-05)

63. *Trading Memory for Randomness*
Krishnendu Chatterjee, Luca de Alfaro and Thomas A. Henzinger
Proceedings of 1st International Conference on Quantitative Evaluation of Systems (QEST-04)

64. *On Nash Equilibria in Stochastic Games*
Krishnendu Chatterjee, Rupak Majumdar and Marcin Jurdziński
Proceedings of the 13th Annual Conference of the European Association for Computer Science Logic (CSL-04)

65. *Complexity of Compositional Model Checking of Computation Tree Logic on Simple Structures*
Krishnendu Chatterjee, Pallab Dasgupta and P.P. Chakrabarti
International Workshop on Distributed Computing (IWDC-04)

66. *Games with Secure Equilibria*
Krishnendu Chatterjee, Thomas A. Henzinger and Marcin Jurdziński
Proceedings of the 19th Annual Symposium on Logic in Computer Science (LICS-04)

67. *Quantitative Stochastic Parity Games*
Krishnendu Chatterjee, Marcin Jurdziński and Thomas A. Henzinger
Proceedings of 15th ACM-SIAM Annual Symposium on Discrete Algorithm (SODA-04)

68. *Simple Stochastic Parity Games*
Krishnendu Chatterjee, Marcin Jurdziński and Thomas A. Henzinger
Proceedings of the 12th Annual Conference of the European Association for Computer Science Logic (CSL-03)

69. *Stack Size Analysis of Interrupt Driven Programs*
Krishnendu Chatterjee, Di Ma, Rupak Majumdar, Tian Zhao,Thomas A. Henzinger and Jens Palsberg
Proceedings of 10th International Static Analysis Symposium (SAS-03)

70. *Implementation of Shape Grammar for Plan Analysis*
Sanhita Mallick, Krishnendu Chatterjee, Arif. N. Merchant and Pallab Dasgupta
International Conference on Information Technology for Built Environment (IT- Built -2002)

71. *Weighted Quantified Computation Tree Logic*
Krishnendu Chatterjee, Pallab Dasgupta and P.P. Chakrabarti
International Conference on Information Technology,2001(CIT-2001)

Journals

1. *Timed Games: Complexity and Robustness*
Krishnendu Chatterjee, Thomas A. Henzinger and Vinayak Prabhu
Logical Methods in Computer Science (LMCS)

2. *Qualitative Concurrent Parity Games*
Krishnendu Chatterjee, Luca de Alfaro and Thomas A. Henzinger
ACM ToCL

3. *Expressiveness and Closure Properties for Quantitative Languages*
Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
Logical Methods in Computer Science (LMCS)

4. *Algorithms for Game Metrics*
Krishnendu Chatterjee, Luca de Alfaro, Rupak Majumdar and Vishwanath Raman
Logical Methods in Computer Science (LMCS)

5. *Quantitative Languages*
Krishnendu Chatterjee, Laurent Doyen and Thomas A. Henzinger
ACM ToCL

6. *Strategy Construction for Parity Games with Imperfect Information*
   Dietmar Berwanger, Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger and Sangram Raje
   Information and Computation
7. *Strategy Logic*
   Krishnendu Chatterjee, Thomas A. Henzinger and Nir Piterman
   Information and Computation
8. *Qualitative Logics and Equivalences for Markov Decision Processes*
   Krishnendu Chatterjee, luca, Marco Faella and Axel Legay
   Logical Methods in Computer Science (LMCS)
9. *Finitary Winning in ω-Regular Games*
   Krishnendu Chatterjee, Thomas A. Henzinger and Florian Horn
   ACM Transactions on Computational Logic (TOCL)
10. *Reduction of Stochastic Parity to Stochastic Mean-payoff Games*
    Krishnendu Chatterjee and Thomas A. Henzinger
    Information Processing Letters (IPL)
11. *Concurrent Games with Tail Objectives*
    Krishnendu Chatterjee
    Theoretical Computer Science (TCS)
12. *Stochastic Limit-average Games are in EXPTIME*
    Krishnendu Chatterjee, Rupak Majumdar and Thomas A. Henzinger
    International Journal of Game Theory
13. *A Survey of Stochastic ω-regular Games*
    Krishnendu Chatterjee and Thomas A. Henzinger
    Journal of Computer Science and Systems (JCSS)
14. *Algorithms for Omega-Regular Games with Imperfect Information*
    Krishnendu Chatterjee, Laurent Doyen, Thomas A. Henzinger and Jean-Francois Raskin
    Logical Methods in Computer Science (LMCS) 3 (3), 2007
15. *Games with Secure Equilibria*
    Krishnendu Chatterjee, Thomas A. Henzinger and Marcin Jurdziński
    Theoretical Computer Science (TCS) 365 (2), 67-82, 2006
16. *The Power of First Order Quantification over States in Branching and Linear Time Temporal Logics*
    Krishnendu Chatterjee, Pallab Dasgupta and P.P. Chakrabarti
    Information Processing Letters (IPL) 91 (5) 201-210, 2004
17. *Stack Size Analysis of Interrupt Driven Programs*
    Krishnendu Chatterjee, Di Ma, Rupak Majumdar, Tian Zhao, Thomas A. Henzinger and Jens Palsberg
    Information and Computation, 194 (2), 144-174, 2004
18. *A Branching Time Temporal Framework For Quantitative Reasoning*
    Krishnendu Chatterjee, Pallab Dasgupta and P.P. Chakrabarti
    Journal of Automated Reasoning (JAR) 30 (2), 205-232, 2003

Tools Associated With

1. *CHIC* (Checking Interface Compatibility).
2. *WikiTrust*.
3. *Alpaga*.
4. *GIST*.

Patents

1. **IBM Invention Disclosure:** " Remote Authentication of Fingerprints Over An Insecure Network" (United States Patent 6778688)
   Pradeep Kumar Dubey, Pooja Aggarwal, Krishnendu Chatterjee, Charanjit Singh Jutla and Vijay Kumar.

Technical Reports (that have not appeared in proceedings of Conferences or Journals)

1. *Qualitative Concurrent Parity Games*
   Krishnendu Chatterjee, Luca de Alfaro and Thomas A. Henzinger
   Technical Report: UCSC-CRL-08-02, University of California, Santa Cruz, 2008.
2. *Assigning Trust to Wikipedia Content*
   Bo Adler, Jason Benterou, Krishnendu Chatterjee, Luca de Alfaro, Ian Pye and Vishwanath Raman
   Technical Report: UCSC-CRL-07-09, University of California, Santa Cruz, 2007.
3. *Linear Time Algorithm for Weak Parity Games*
   Krishnendu Chatterjee
   Technical Report: EECS-2006-153, EECS Department, University of California, Berkeley, 2006.
4. *Stochastic ω-Regular Games*
   Krishnendu Chatterjee
   Thesis for partial fulfillment of Ph.D, UC Berkeley
5. *Stack-size analysis for Interrupt Driven Programs*
   Krishnendu Chatterjee
   Thesis for partial fulfillment of Master of Science, UC Berkeley
6. *Weighted Quantified CTL: An efficient logic for verifying extremal timing properties of Timed Model*
   Krishnendu Chatterjee
   Thesis for partial fulfillment of Bachelor of Technology (Hons) degree, Indian Institute of Technology, Kharagpur

References

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