

Rune Møller Jensen

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ACADEMIC APPOINTMENTS

- 2006-present **Associate Professor, The IT University of Copenhagen.**
Director of the [Decision Optimization LAB](#).
Head of B.Sc. Programme on Software Development.
- 2003-2006 **Assistant Professor**, The IT University of Copenhagen.

ACADEMIC DEGREES

- 2003 **Ph.D.** in Computer Science, **Carnegie Mellon University**.
- 2002 **M.Sc.** in Computer Science, Carnegie Mellon University.
- 1999 **M.Sc.** in Informatics, Technical University of Denmark.

COMPANY

- 2007-present **Optivation** - A spinoff company from the IT University of Copenhagen bridging stowage optimization research with industrial application. **CEO** and founder.

AWARDS

- 2006 Outstanding Research Contribution, The IT University of Copenhagen.
- 2005 **Hede Nielsen-Prisen**.
- 1998 The McKinsey Award.

GRANTS

- 2012 6 months post doctoral stipend , *Stowage Textbook*, **The Danish Maritime Fund**
- 2010 3 years industrial Ph.D. stipend *Constrained Based Stowage Planning*, The Danish Agency for Science Technology and Innovation, with Ange Optimization.
- 2009 3 years research grant *Baystow*, The Danish Maritime Fund, with **A.P. Møller-Mærsk** and Ange Optimization.
- 2008 4 years research grant *Enerplan*, The Danish Council for Strategic Research, with A.P. Møller Mærsk and the Technical University of Denmark.

PHD. STUDENTS

- 2010-present Kevin Tierney, *Enerplan*.
- 2009-2011 Afsaneh Doryab, co-advised with Prof. Jacob Bardram, The IT University of Copenhagen.
- 2009-2012 Berit Løfstedt, co-advised with Prof. David Pisinger, Technical University of Denmark, and Mikkel Muhldorff Sigurd, A.P. Møller-Mærsk A/S.
- 2008-2012 Dario Pacino, *Baystow*.
- 2007-present Alberto Delgado-Ortegon, *Constrained Based Stowage Planning*.

INVITED TALKS

- 2013 *Automatic Stowage*, Energy Efficiency with MACS3 Loading Computer, User conference, Hamburg, **Interschalt**
- 2012 *Stowing the Right Containers on Container Vessels*, Workshop on Applications of Optimization - Best Practice and Challenges, the **Danish Operations Research Society** (DORS).
- 2012 11th Workshop of **SweConsNet** and the 27th Annual Workshop of the **Swedish Artificial Intelligence Society** (SAIS) of Constraint programming.
- 2011 *Phase Recognition during Surgical Procedures using Embedded and Body-worn Sensors*, SAS Analytics network meeting, **SAS Institute**.
- 2009 *4 Years Stowage Planning Business-Science Ecosystem: Lessons Learned*, FIRST Research School.
- Current and Planned Educational Initiatives in AI at the IT University of Copenhagen*, Technical University of Denmark.
- Free Software Data Mining Tools*, Business Intelligence Day, **Damco**.
- 2006 *Memory Efficient Symbolic Heuristic Search*, research pearl presentation, The IT University of Copenhagen.
- Symbolic Heuristic Search for Directed Model Checking*, **Dagstuhl-Seminar** 06172, (unable to attend).
- 2005 *State-Set Branching: Integration af Heuristisk og Symbolsk Søgning*, reception Hede Nielsen-Prisen, Odd Fellow Palæet, Copenhagen.
- 2005 *State-Set Branching: Combining Symbolic and Heuristic Search for Large-Scale Deterministic and Non-Deterministic Planning*, **Palo Alto Research Center** (PARC).

CONFERENCES

- 2013 **Co-Chair** and **Local Organizer** of the Fourth International Conference on Computational Logistics (ICCL'13).
- 2012 Program committee member of the Third International Conference on Computational Logistics (ICCL'12).
- Local Organizing Chair** of the 3rd International Conference on Computational Sustainability: CompSust'12.

- 2011 Program committee member of the Second International Conference on Computational Logistics (ICCL'11).
- 2007 **Software Demonstration Chair** of the 17th International Conference on Automated Planning & Scheduling (ICAPS-07).
- 2006 Program committee member of the Twentieth International Joint Conference on Artificial Intelligence (IJCAI-07).
- 2007 Program committee member of the Twenty-First National Conference on Artificial Intelligence (AAAI-06).
Program committee member of the Fifth International Joint Conference on Autonomous Agents and Multiagent Systems (AAMAS-06).
- 2005 Program committee member of the Twentieth National Conference on Artificial Intelligence (AAAI-05).
Program committee member of the 15th International Conference on Automated Planning & Scheduling (ICAPS-05).
- 2004 Mentor of the Doctoral Consortium of the 14th International Conference on Automated Planning & Scheduling (ICAPS-04).
- 2003 **Publicity and Sponsoring Chair** of the 13th International Conference on Automated Planning & Scheduling (ICAPS-03).
- 2000 Program Committee member of the 6th International Conference on Artificial Intelligence Planning and Scheduling (AIPS-00) workshop: *Planning via Model Checking*.

CONSULTANCY ACTIVITIES

- 2013-present Develop stowage planning optimization module for STOWMAN - a commercial stowage planning tool. Client: **Interschalt**.
- 2012-present Develop cargo mix optimization prototypes to increase utilization of vessels. Client: **Maersk Line**.
- 2005-2011 Develop efficient and practical optimization algorithms for container vessel stowage planning. Client: **Maersk Line**.
- 2010-2011 Analyze and Predict customer behavior using data mining. Client: **Damco**.
- 2007 Specify collaborative filtering algorithm for generating customer offers. Client: **COOP**.

TEACHING

Courses

- 2013 Course Responsible Lecturer: *Intelligent Systems Programming*.
- 2012 Course Responsible Lecturer: *Intelligent Systems Programming*.
- 2011 Course Responsible Lecturer: *Efficient Artificial Intelligence Programming*.
- 2010 Course Responsible Lecturer: *Efficient Artificial Intelligence Programming*.
- 2009 Course Responsible Lecturer: *Efficient Artificial Intelligence Programming*.
Lecturer: *Performance and Test*.

- Course Responsible Lecturer: *Large Scale Optimization Methods*, PhD course.
- 2008 Course Responsible Lecturer: *Efficient Artificial Intelligence Programming*.
Lecturer: *Performance and Test*.
- 2007 Lecturer: *Advanced Algorithms*.
Course Responsible Lecturer: *Efficient Artificial Intelligence Programming*.
- 2006 Course Responsible Lecturer: *Logic-Based Methods for Optimization*, PhD course.
Lecturer: *Network and Protocols*, The IT University of Copenhagen.
- 2005 Course Responsible Lecturer: *Efficient Artificial Intelligence Programming*.
- 2004 Course Responsible Lecturer: *Introduction to Algorithms and Data Structures*.
Course Responsible Lecturer: *Software Products*.
- 2003 Lecturer: *IT-Platforms and Organization*.

M.Sc. Students

- 2012 *SAT and SMT-based Interactive Configuration for Container Vessel Stowage Planning*, Christian Kroer and Martin K. Svendsen
- 2011 *Fitness Landscape Specific Local Search Portfolio*, Tinus Mørch Abell.
- 2010 *Using Conditional Random Fields to predict customer loss from transactional shipping order data*, Garry Hopwood and Tomasz Pawel Pruchnicki.
A library for incremental expression evaluation, Kåre Lind.
Pervasive Healthcare - An Investigation in Activity Recognition, Sren Torp Petersen, Kristian Laurits Godthjælp Nielsen, Poul Martin Lange, (**paper at PerCom 2011**).
- 2009 *An Analysis of Container Stuffing Timeliness using Data Mining*, Nishandan Ganesalingam.
Modeling container ship stowage problems using binary decision diagrams, Eilif Leknes.
A visualization tool for the under deck container stowage problem, Zongbo Zhang.
Large scale modular configuration problems, Morten Riiskjær Boysen and Andreas Hau Nørgaard, (**paper at IJCAI 09 workshop on configuration**).
- 2008 *A COMET-Based Meta Heuristic for Assigning Containers to Cells in Under Deck Storage Locations*, Dario Pacino.
Computational Complexity - The Complexity of Subproblems of the Satisfiability Problem and the Container Stowage Problem, Mai Lise Ajspur.
Multiple Opponents Poker Bot, Jakob Roed Kierkegaard and Andreas Juul Hirszhorn.
Implementing realistic human motion in Games, Elly Onesmo Nkya.
G.I.Ants - Design Techniques For Builder Games, Jørgen Krabbe, Thomas Richard Dougans, Cristopher Mongkolsri Voldum, and Bjarne Kristiansen.

- 2007 *Coach scheduling optimisation*, Knut Tveitane.
Constraint Optimization for Highly Constrained Logistic Problems, Maria Kinga Mochnacs, and Meang Akira Tanaka.
- 2006 *Implementation of CLab1.0 in C#*, Torbjørn Meistad, Yngve Raudberget, and Geir-Tore Lindsve.
Constraint satisfaction for interactive product configuration, Efstratios Kalogirou.

PUBLICATIONS

- 51 A. Delgado, R.M. Jensen, and N. Guilbert, *A Placement Heuristic for a Commercial Decision Support System for Container Vessel Stowage*, In Proceedings of CLEI, 2012.
- 50 D. Pacino, A. Delgado, R.M. Jensen, and T. Bebbington, *An Accurate Model for Seaworthy Container Vessel Stowage Planning with Ballast Tanks*, In the Proceedings of the 3rd International Conference on Computational Logistics (ICCL'12), LNCS 7555, pp. 17-32, 2012.
49. K. Tierney and R.M. Jensen, *The Liner Shipping Fleet Repositioning Problem with Cargo Flows*, In the Proceedings of the 3rd International Conference on Computational Logistics (ICCL'12), LNCS 7555, pp. 1-16, 2012.
48. K. Tierney, A.J. Coles, A.I. Coles, C. Kroer, A. Britt, R.M. Jensen, *Automated Planning for Liner Shipping Fleet Repositioning*, In the Proceedings of the 22nd International Conference on Automated Planning and Scheduling (ICAPS'12), 2012.
47. R.M. Jensen, E. Leknes, and T. Bebbington, *Fast Interactive Decision Support for Modifying Stowage Plans Using Binary Decision Diagrams*, In the Proceedings of the International MultiConference of Engineers and Computer Scientists 2012 (IMECS'12), Vol II, pages 1555-1561, 2012.
46. D. Pacino and R.M. Jensen, *Constraint-Based Local Search for Container Stowage Slot Planning*, In the Proceedings of the International MultiConference of Engineers and Computer Scientists 2012 (IMECS'12), Vol II, pages 1467-1472, 2012.
45. A. Delgado, R.M. Jensen, K. Janstrup, T.H. Rose, and K.H. Andersen, *A Constraint Programming Model for Fast Optimal Stowage of Container Vessel Bays*, European Journal of Operational Research, Volume 220, Issue 1, Pages 251261, 2012.
44. A. Delgado, R.M. Jensen, and N. Guilbert, *AngleStow: A Commercial Optimization-Based Decision Support Tool for Stowage Planning*, Presentation at the 2nd International Conference on Computational Logistics (ICCL'11), 2011.
43. K. Tierney and R.M. Jensen, *Liner Shipping Fleet Repositioning*, Presentation at the 2nd International Conference on Computational Logistics (ICCL'11), 2011.

42. D. Pacino, A. Delgado, R.M. Jensen, and T. Bebbington, *Fast Generation of Near-Optimal Plans for Eco-Efficient Stowage of Large Container Vessels*, In the Proceedings of the 2nd International Conference on Computational Logistics (ICCL'11), Springer, LNCS 6971, pages 286-301, 2011.
41. K. Tierney and R.M. Jensen, *Temporal Optimization Planning for Fleet Repositioning*, The 21st International Conference on Automated Planning and Scheduling (ICAPS-11) Workshop on Scheduling and Planning Applications (SPARK-11), pages 90-97, 2011.
40. J.E. Bardram, A. Doryab, R.M. Jensen, P.M. Lange, K.L.G. Nielsen, and S.T. Petersen, *Phase Recognition during Surgical Procedures using Embedded and Body-worn Sensors*, IEEE International Conference on Pervasive Computing and Communications (PerCom-11), IEEE International, pages 45-53, 2011.
39. R.M. Jensen, *On the Complexity of Container Stowage Planning: the Capacitated Zero-Shift Problem and the Hatch Overstow Problem*, Technical Report, ITU-TR-137, IT University of Copenhagen, 2010.
38. A. Delgado, R.M. Jensen, and K. H. Andersen, *A Constraint Programming Model for Fast Optimal Stowage of Container Vessel Bays*, Technical Report, ITU-TR-133, IT University of Copenhagen, 2010.
37. A. Delgado, R.M. Jensen, and C. Schulte. *Generating Optimal Stowage Plans for Container Vessel Bays*, In the Proceedings of the 15th International Conference on Principles and Practice of Constraint Programming (CP-09), Springer, LNCS Series, Vol. 5732, pages 6-20, 2009.
36. D. Pacino and R.M. Jensen, *A Local Search Extended Placement Heuristic for Stowing Under Deck Bays of Container Vessels*, In the proceedings of Fourth International Workshop on Freight Transportation and Logistics (ODYSSEUS 2009), 2009.
35. A.H. Nørgaard, M.R. Boysen, R.M. Jensen, and P. Tiedemann, *Combining Binary Decision Diagrams and Backtracking Search for Scalable Backtrack-Free Interactive Product Configuration*, In the Proceedings of the 21st International Joint Conferences on Artificial Intelligence (IJCAI-09) Workshop on Configuration, 2009.
34. R.M. Jensen, M.M. Veloso, and R.E. Bryant. *State-Set Branching: Leveraging OBDDs for Heuristic Search*. Artificial Intelligence, Volume 172, pages 103-139, 2008.
33. M.L. Ajspur, R.M. Jensen, and N. Guilbert. *Minimizing Lid Overstows in Master Stowage Plans for Container Vessels is NP-Complete*, Technical Report ITU-TR-2008-107, IT University of Copenhagen, 2008.
32. M.K. Mochnacs, M.A. Tanaka, A. Nyborg, and R.M. Jensen. *Constraint Optimization for Highly Constrained Logistic Problems*, Technical Report ITU-TR-2008-104, IT University of Copenhagen, 2008.
31. R.M. Jensen and F. Kabanza (eds.). *Proceedings of the Systems Demonstrations of the 17th International Conference on Automated Planning and scheduling (ICAPS-07)*., Electronic publication, AAAI, 2007.

30. R.M. Jensen and M.M. Veloso. *Learning Non-Deterministic Multi-Agent Planning Domains*, In Proceedings of the 17th International Conference on Automated Planning and Scheduling (ICAPS-07) Workshop on Artificial Intelligence Planning and Learning, 2007.
29. R.M. Jensen, E.A. Hansen, S. Richards, and R. Zhou. *Memory-Efficient Symbolic Heuristic Search*, In proceedings of the 16th International Conference on Automated Planning and Scheduling (ICAPS-06), pages 304-313, 2006.
28. M.H. Bowling, R.M. Jensen, and M. M. Veloso. *Multi-Agent Planning in the Presence of Multiple Goals*. In Planning in Intelligent Systems: Aspects, Motivations, and Methods, Wout van Wezel, R.J. Jorna, Alexander M. Meystel eds., ISBN: 0-471-73427-6, Wiley, pages 303-327, 2006.
27. R.M. Jensen and M.M. Veloso. *ASET: a Multi-Agent Planning Language with Non-Deterministic Durative Tasks for BDD-based Fault Tolerant Planning*, In Proceedings of the 15th International Conference on Automated Planning and Scheduling (ICAPS-05) Workshop on Multi-Agent Planning, 2005.
T. Hadzic, R. M. Jensen, Henrik R. Andersen, *Calculating Valid Domains for BDD-Based Interactive Configuration*, IT University of Copenhagen, 2005.
26. T. Hadzic, S. Sathiamoorthy, R.M. Jensen, H.R. Andersen, J. Møller and H. Hulgaard. *Fast Backtrack Free Product Configuration using Precompiled Solution Space Representations*. In the Proceedings of the International Conference on Economic, Technical and Organisational aspects of Product Configuration Systems, 2004.
25. R.M. Jensen, M.M. Veloso, and R.E. Bryant. *Fault Tolerant Planning: Toward Probabilistic Uncertainty Models in Symbolic Non-Deterministic Planning*. In Proceedings of the 14th International Conference on Automated Planning & Scheduling (ICAPS-04), pages 325-335, 2004.
24. S. Subbarayan, R.M. Jensen, T.Hadzic, H.R. Andersen, J. Møller, and H. Hulgaard. *Comparing Two Implementations of a Complete and Backtrack-Free Interactive Configurator*, In Proceedings of the CP-04 Workshop on CSP Techniques with Immediate Application, pages 97-111, 2004.
23. R.M. Jensen. *CLab: a C++ Library for Fast Backtrack-Free Interactive Product Configuration*, In Proceedings of the Tenth International Conference on Principles and Practice of Constraint Programming (CP-04), page 816, 2004.
22. R.M. Jensen. *CLab 1.0 User Manual*, Technical Report ITU-TR-2003-46, IT University of Copenhagen
21. R.M. Jensen, M.M. Veloso, and R.E. Bryant. *Guided Symbolic Universal Planning*. In Proceedings of the 13th International Conference on Automated Planning & Scheduling (ICAPS-03), pages 123-132, 2003.
20. R.M. Jensen, M.M. Veloso, and R.E. Bryant. *Synthesis of Fault Tolerant Plans for Non-Deterministic Domains*. In Proceedings of ICAPS-03 Workshop on Planning under Uncertainty and Incomplete Information, pages 64-73, 2003.
19. R.M. Jensen and M.M. Veloso. *UMOP 1.2 Software Demonstration*, In Printed Notes of ICAPS-03 System Demos, 2003.
18. R.M. Jensen and H.R. Andersen. *Substitution and Flip BDDs*, Technical Report ITU-TR-2003-41, IT University of Copenhagen, 2003.

17. R.M. Jensen. *DES Controller Synthesis and Fault Tolerant Control*, Technical Report ITU-TR-2003-40, IT University of Copenhagen, 2003
16. R.M. Jensen. *Efficient BDD-Based Planning for Non-Deterministic, Fault-Tolerant, and Adversarial Domains*, PhD Thesis, Computer Science dept., Carnegie Mellon University, CMU-CS-03-139, 2003.
15. M.H. Bowling, R.M. Jensen, and M.M. Veloso. *A formalization of equilibria for multiagent planning*. Workshop of the 18th National Conference on Artificial Intelligence (AAAI-02) on Planning with and for Multiagent Systems, 2002.
14. R.M. Jensen, R.E. Bryant, and M.M. Veloso. *An Efficient BDD-based A* Algorithm*. Workshop of the 6th International Conference on Artificial Intelligence Planning and Scheduling (AIPS-02) on Planning via Model Checking, 2002.
13. R.M. Jensen, R.E. Bryant, and M.M. Veloso. *SetA* Applied to Channel Routing*. Technical Report CMU-CS-02-172, Computer Science Department, Carnegie Mellon University, 2002.
12. R.M. Jensen. *A Comparison Study between the CUDD and BuDDy OBDD Package Applied to AI-Planning problems*. Technical Report CMU-CS-02-173, Computer Science Department, Carnegie Mellon University, 2002.
11. R.M. Jensen, R.E. Bryant, and M.M. Veloso. *State-Set Branching: Leveraging OBDDs for Heuristic Search*. Technical Report CMU-CS-02-174, Computer Science Department, Carnegie Mellon University, 2002.
10. R.M. Jensen, R.E. Bryant, and M.M. Veloso. *SetA*: An efficient BDD-Based Heuristic Search Algorithm*. In Proceedings of 18th National Conference on Artificial Intelligence (AAAI-02), pages 668-673, 2002.
9. R.M. Jensen, M.M. Veloso and M.H. Bowling. *OBDD-Based Optimistic and Strong Cyclic Adversarial Planning*. In Proceedings of the 6th European Conference on Planning (ECP-01), pages 265-276, 2001.
8. R.M. Jensen and M.M. Veloso. *OBDD-based Universal Planning for Synchronized Agents in Non-Deterministic Domains*. Journal of Artificial Intelligence Research, Volume 13, pages 189-226, 2000.
7. R.M. Jensen and M.M. Veloso. *OBDD-based Universal Planning for Multiple Synchronized Agents in Non-Deterministic Domains*. In Proceedings of the 5th International Conference on Artificial Intelligence Planning and Scheduling (AIPS-00), AAAI Press, pages 167-176, 2000.
6. R.M. Jensen and M. M. Veloso. *OBDD-based Deterministic Planning using the UMOP Planning Framework*. Workshop of the 5th International Conference on Artificial Intelligence Planning and Scheduling (AIPS-00) on Model-Theoretic Approaches to Planning, 2000.
5. R.M. Jensen. *BDD-based Universal Planning in Multi-Agent, Non-Deterministic Domains*. Master's Thesis, Technical University of Denmark, IAU99F02, 1999.
4. R.M. Jensen and M.M. Veloso. *OBDD-based Universal Planning: Specifying and Solving Planning Problems for Synchronized Agents in Non-Deterministic Domains*. In Artificial Intelligence Today, Recent Trends and Developments. M.J. Wooldridge and M. Veloso (Eds.), Springer-Verlag, pages 212-248, 1999.

3. R.M. Jensen. *Specification and Verification of Complex Robotics Tasks*. Workshop of the 10th European Summer School in Logic, Language and Information (ESSLLI-98) on Duration Calculus, 1998.
2. R.M. Jensen and M.M. Veloso. *Interleaving Deliberative and Reactive Planning in Dynamic Multi-Agent Domains*. AAAI Fall Symposium on Integrated Planning for Autonomous Agent Architectures, 1998.
1. C. Bundesen, S. Kyllingsbæk, K.J. Houmann and R.M. Jensen. *Is Visual Attention Attracted by One's Own Name?*. Perception & Psychophysics, 59(5), pages 714-720, 1997.