THOMAS RICHARDSON

4502 Greenwood Avenue North
Seattle, WA 98103
e-mail: tsr@stat.washington.edu

EDUCATION

CARNEGIE MELLON UNIVERSITY	Pittsburgh, USA
Ph.D. Logic, Computation & Methodology	*August, 1996*
M.Sc. Logic & Computation	*August, 1995*
MERTON COLLEGE	Oxford, UK
B.A.(Hons), Mathematics & Philosophy	*August, 1992*

THESES

Ph.D. Thesis: *Feedback Models: Interpretation and Discovery*

M.Sc. Thesis: *Properties of Cyclic Graphical Models*

EMPLOYMENT

UNIVERSITY OF WASHINGTON	Seattle, USA
Department of Statistics	
Full Professor	*Fall 2007-*
Associate Professor	*Fall 2000-Fall 2007*
Assistant Professor	*Fall 1996-Fall 2000*
Department of Economics	*Winter 2007-*
Adjunct Associate Professor	
UNIVERSITY OF WARWICK	Coventry, UK
Lecturer	*Fall 1999-Fall 2000*
ZENTRUM FÜR UMFRAGEN, METHODEN UND ANALYSEN (ZUMA)	Mannheim, Germany *July, 1999*
Gastprofessor	

RESEARCH GRANTS

Co-PI: NIH *Predicting bone formation induced by mechanical loading using agent based models* (PI: S. Srinivasan, Univ. of Washington)	*Dec 2006-Nov 2008*
Co-PI: CSSS Seed grant Improved Confidence Intervals for Subvectors in IV Regression with Weak Identification (PI: Eric Zivot, UW Economics)	*Dec 2006-Dec 2007*
PI: NSF-DMS *Graphical and Algebraic Models for Multivariate Categorical Data* (Collaborative grant with M. Drton, at University of Chicago)	*July 2006-July 2009*
Co-PI: NIH: *Analytic methods for HIV treatment and co-factor effects* Harvard School of Public Health (J.Robins, PI) (UW Subcontract)	*June 2005-May 2010*
PI: RRF Grant: *Likelihood inference in regression systems in the presence of multimodality*	*Sept 2003-Sept 2004*
PI: CSSS Seed Grant: *Intonation in Unangas (Western Aleut), an endangered Alaskan language*, (J. Wegelin and A. Taff).	*Sept 2001-July 2002*
Co-PI: DARPA-CFI: *Graphical Models: Mixing Knowledge and Data-Driven Techniques*. (Jeff Bilmes, PI).	*Summer 2001*
PI: NSF-DMS Grant *Graphical Markov Models with Interpretable Structure*	*Nov 1999-Aug 2003*

PI: EPA-NRCSE Grant *1999-2002*
Graphical Models for statistical and causal inferences about mortality from airborne particles (PM)

Co-PI: NSF-DMS Grant *Graphical Markov Models, Structural Equation Models, and Related Models of Multivariate Dependence* *June 1997-June 2000*
PI: Michael Perlman

PI: RRF Grant Bayesian software tools for causal model search *June 1997-June 1999*

AWARDS & FELLOWSHIPS

VISITING SENIOR RESEARCH FELLOW — Jesus College, Oxford, *Jan-June 2008*

INSTITUTE FOR ADVANCED STUDIES — University of Bologna
Fellowship *Sept-Dec 2007*

CENTER FOR ADVANCED STUDIES IN THE BEHAVIORAL SCIENCES — Stanford University, Palo Alto, USA
Fellowship *January-June 2004*

ISAAC NEWTON INSTITUTE — Cambridge, UK
Rosenbaum Fellow *July - Dec 1997*

20TH CONFERENCE ON UNCERTAINTY IN ARTIFICIAL INTELLIGENCE — Banff, Canada *July 2004*
Outstanding Student Paper Award
(as co-author)

12TH CONFERENCE ON UNCERTAINTY IN ARTIFICIAL INTELLIGENCE — Portland, USA *Aug 1996*
Outstanding Student Paper Award

PHD STUDENTS SUPERVISED		**Affiliation**
Defended: 2006	Erica Moodie (Biostatistics)	*McGill University Canada*
2005	Sanjay Chaudhuri (with M. Perlman)	*National University of Singapore*
2004	Mathias Drton (with M. Perlman)	*University of Chicago*
2003	Ayesha Ali	*University of Guelph Canada*
2002	Jacob Wegelin (with P. Sampson)	*UC Davis*
1999	Greg Ridgeway (with D. Madigan)	*RAND*
MSC STUDENTS		
1999	Jake Brutlag	*Google*
PHD COMMITTEES	Accounting; Biostatistics; Computer Science; Economics; Electrical Engineering; Finance; Fisheries; Forestry; Mechanical Engineering; Statistics	
EDITING	Proceedings of the Twenty-Second Conference on Uncertainty in Artificial Intelligence (with R. Dechter)	*July 2006*
	Associate Editor for *The Journal of the Royal Statistical Society Series B*.	*Aug 1999-July 2004*
	Proceedings of the Eighth International Workshop on Artificial Intelligence and Statistics (with T. Jaakkola)	*Jan 2001*
	Guest Editor for *Statistics and Computing*	*Aug 1997-Aug 1999*

REVIEWING

STATISTICS: Annals of Statistics; Bernoulli; Biometrika; Communications in Statistics; Games and Economic Behavior; International Journal of Biostatistics, International Statistical Review; Journal of Multivariate Analysis; Journal of the Royal Statistical Society; Probability Theory and Related Fields; Scandinavian Journal of Statistics; Statistical Modelling; Statistica Sinica; Statistics and Computing; Learning in Graphical Models.

SOCIAL SCIENCE: Erkenntnis; Sociological Methodology; Sociological Methods and Research; Behaviormetrika

COMPUTER SCIENCE: Conference on AI and Statistics; International Joint Conference on AI; Journal of AI Research; Knowledge Discovery and Data Mining; Machine Learning; Neural and Information Processing Systems; IEEE Transactions on Knowledge and Data Engineering; Oxford University Press; Conference on Uncertainty in Artificial Intelligence; IEEE Transactions on Signal Processing.

MATHEMATICS: Journal of Combinatorial Theory

GRANT PROPOSALS AGENCIES: NSF; EPSRC (UK); RRF

CONFERENCE ORGANIZING	WNAR/IMS MEETING IMS Program Chair	*June 2007*
	23RD CONFERENCE ON UNCERTAINTY IN ARTIFICIAL INTELLIGENCE General Co-Chair	*July 2007*
	22ND CONFERENCE ON UNCERTAINTY IN ARTIFICIAL INTELLIGENCE Program Co-Chair	*July 2006*
	IMS/BERNOULLI SOCIETY MEETING Session organizer	Barcelona, Spain *July 2004*
	WNAR/IMS MEETING Session organizer	Los Angeles, USA *June 2002*
	ASSOCIATION FOR AI AND STATISTICS Conference organizer (with T. Jaakkola, MIT)	Fort Lauderdale, USA *Jan 2001*
	FIELDS INSTITUTE Seminar organizer (with P.Spirtes, CMU) *Causal Structure and Conditional Independence*	Toronto, Canada *Oct 1999*
	IMS CONFERENCE ON GRAPHICAL MODELS Webmaster	Seattle, USA *June 1997*
ADVISORY PANELS	SOCIETY FOR AI AND STATISTICS	*January 2001-*
	HARVARD SCHOOL OF PUBLIC HEALTH *Causal Epidemiology program*	*January 2001*

PROGRAM COMMITTEES	CONFERENCE ON UNCERTAINTY IN AI	*2000-05*
	CONFERENCE ON KNOWLEDGE DISCOVERY AND DATABASES	*2000*
	INTERNATIONAL WORKSHOP ON AI AND STATISTICS	*1999,2005*
	INTERNATIONAL JOINT CONFERENCE ON AI	*1999, 2002*
	CONFERENCE ON NEURAL AND INFORMATION PROCESSING SYSTEMS	*1998-2000, 2002, 2005,2006*
UW SERVICE	Acting Director, Center for Statistics and the Social Sciences	July 2006-Sept 2007
	Associate Director, Center for Statistics and the Social Sciences	June 2005-June 2006
	Faculty Field Tour	*June 1998*
	Faculty Fellows Program	*September 1996*
DEPT SERVICE	Chair, Pedagogy Committee	*2002-2003*
	Computing Committee	*1998-1999, 2000*
	Graduate Admissions Committee	*1998,2005,2006*
	Ph.D. Applied Prelim Committee	*2002-2004, 2006*
	M.Sc. Applied Exam Committee	*2005*
	Stochastic Modelling Prelim Committee	*1997, 1998*
	Computing Prelim Committee	*1997, 1999*
	Applied Prelim Committee	*1998, 2003*
	Executive Committee, Center for Statistics and the Social Sciences	*September 2003-*
	Search Committees, Center for Statistics and the Social Sciences	*2005-6 (Chair)* *2001-2003*
	Web-developer for UIF Proposal: Center for Statistics and the Social Sciences	*April-June 1999*

PRESENTATIONS

Cornell University Statistics Department Seminar	*March 2007*
Institute for Mathematics and its Applications, Minneapolis Invited Talk	*March 2007*
SAMSI Workshop on Random Matrices Invited Talk	*November 2006*
Harvard School of Public Health Biostatistics Department Seminar	*October 2006*
AMS Meeting, San Antonio Texas Invited Talk	*January 2006*
Penn State Statistics Department Department Seminar	*November 2005*
Graphical Models Workshop in Smögen Invited Talk	*September 2005*
Joint Statistics Meeting Invited Talk	*August 2005*
UW Statistics Department Seminar	*February 2005*
Duke/SAMSI Latent Variable in the Social Sciences Meeting	*September 2004*
Joint Statistics Meeting Invited Discussant	Toronto, Canada *August 2004*

Stanford University, Statistics Department Department Seminar	Palo Alto, California *May 2004*
UC Berkeley, Mathematics Department Algebraic Statistics Workshop	Berkeley, California *May 2004*
Center for Advanced Studies in the Behavioral Sciences Seminar	Palo Alto, California *Feb 2004*
Social Epidemiology, Health Disparities Symposium	*May 2003*
UW, CSSS seminar	*March, 2003*
UW, Electrical Engineering Graphical Models Seminar	*March 2003*
UW, Statistics Data Mining Seminar	*Fall 2002*
IMS Conference (on behalf of M. Drton)	Banff, Canada *August 2002*
Univ. of Washington, CSSS Seminar	*April 2002*
Royal Statistical Society, Read paper.	London, UK *December 2001*
Institute of Information Theory and Automation, (UTIA),	Prague, Czech Rep. *November 2001*
School of Economics (VSE),	Prague, Czech Rep. *November 2001*

Causal Inference Conference	Snowbird, Utah *August 2001*
Center for Language and Speech Processing (CLSP), EE Dept., Johns Hopkins	Baltimore, Maryland *August 2001*
European Science Foundation (ESF), Highly Structured Stochastic Systems (HSSS), Closing Workshop	Luminy, France, *November 2000*
Department of Statistics, University of Washington	Seattle, Washington *November 2000*
Center for Statistics and the Social Sciences, University of Washington	Seattle, Washington *November 2000*
Bernoulli-RIKEN Meeting on Neural Networks and Learning, RIKEN (Institute of Physical and Chemical Research)	Tokyo, Japan *October 2000*
Bernoulli/IMS Joint Meeting Invited speaker	Guanajuato, Mexico *May 2000*
University of Lancaster, UK, Department of Mathematics,	Lancaster, UK *May 2000*
Danish Agricultural Sciences Institute	Foulum, Denmark *April 2000*
University of Aalborg, Department of Mathematical Sciences,	Aalborg, Denmark *April 2000*
University of Warwick, UK, Department of Statistics,	*March 2000*

Imperial College, University of London, Department of Statistics,	*March 2000*
ESF HSSS Conference on Graphical Models Invited speaker	Munich, Germany *March 2000*
Dept. of Statistics, University of Toronto Departmental seminar	Toronto, Canada *November 1999*
International Statistical Institute Conference Invited speaker	Helsinki, Finland *August 1999*
IMS-WNAR Meeting Invited discussant	Seattle, USA *June 1999*
CALD Seminar, Robotics Dept, CMU Invited talk	Pittsburgh, USA *February 1999*
Conference on AI & Statistics Speaker, plenary session	Fort Lauderdale, USA *January 1999*
ESF HSSS Workshop on Structural Learning in Graphical Models Invited speaker	Tirano, Italy *September 1998*
Joint Statistical Meetings, ASA/IMS Invited speaker	Dallas, USA *August 1998*
Conference on Automated Learning and Discovery (ConALD) Invited speaker	Pittsburgh, USA *June 1998*
Valencia Meeting on Bayesian Statistics Invited discussant	Valencia, Spain *May 1998*

Dept. of Statistics, University of Washington Departmental seminar	Seattle, USA *March 1998*
Working Group on Model Based Clustering, Dept. of statistics, University of Washington Invited talk	Seattle, USA *February 1998*
Newton Institute Conference on Bayesian Methods	Cambridge, UK *December 1997*
Dept. of Statistics, University of Oxford Departmental seminar	Oxford, UK *November 1997*
Dept. of Statistics, University of Warwick Departmental seminar	Coventry, UK *November 1997*
ESF HSSS Workshop on Multivariate Research with Latent Variables Invited speaker	Wiesbaden, Germany *November 1997*
Human Communications Research Center, University of Edinburgh Invited talk	Edinburgh, UK *November 1997*
Dept. of Statistics, University College London Departmental seminar	London, UK *November 1997*
StatsLab, University of Cambridge Departmental seminar	Cambridge, UK *November 1997*

Conference on Stochastic Model Building, Duke University Invited speaker	Durham, USA *October 1997*
Newton Institute Conference on Graphical Models Invited speaker	Cambridge, UK *August 1997*
Santa Fe Institute Conference on Inferential problems in the analysis of treatment effects	Santa Fe, USA *July 1997*
UW/Microsoft Research Workshop on Data Mining Invited participant	Seattle, USA *July 1997*
IMS Conference on Graphical Models Invited talk	Seattle, USA *June 1997*
Law School, University of Washington Invited talk	Seattle, USA *May 1997*
University of Tampere Invited talk	Hämeenlinna, Finland *April 1997*
Conference on Artificial Intelligence and Statistics	Fort Lauderdale, USA *January 1997*
International Association for Statistical Computing (IASC) Invited speaker	Pasadena, USA *February 1997*
Working Group on Model Based Clustering, Dept. of Statistics, University of Washington. Invited talk	Seattle, USA *February 1997*

	12th Conference on Uncertainty in Artificial Intelligence Speaker, plenary session	Portland, USA *August 1996*
	ESF HSSS Workshop on Association Models with Latent Variables Invited speaker	Wiesbaden, Germany *July 1996*
	Dept. of Statistics, University of Washington	Seattle, USA *April 1996*
	11th Symposium on Computational Statistics (COMPSTAT) Speaker, section on Model Fitting	Vienna, Austria *August 1994*
SHORT COURSES	Together with N.Wermuth, taught the University of Umeå, Winter Conference Course (4 days).	Bjorgafjall March 2006
	Taught a five day course on Bayesian Networks, for the Complex Systems Group, Computer Science Dept., University of Helsinki	Helsinki, Finland *April 1997*

BIBLIOGRAPHY

Principal author(s) are underlined.

PAPERS IN REFEREED JOURNALS

M. Drton, T.S. Richardson (2008). Binary Models for Marginal Independence. Accepted for publication in *Journal of the Royal Statistical Society Series B*.

S. Chaudhuri, M. Drton, T. S. Richardson (2007). *Estimation of a Covariance Matrix with Zeros*. Biometrika 94(1), pp. 199-216(18).

E. Moodie, T.S Richardson, D. Stephens (2007). *Demystifying Optimal Dynamic Treatment Regimes*. Accepted for publication in Biometrics.

A. Glynn, J. Wakefield, M. Handcock, T. S. Richardson (2007) *Alleviating Linear Ecological Bias and Optimal Design with Subsample Data*. Accepted for publication in Journal of the Royal Statistical Society Ser. A.

S. Srinivasan, B. J. Ausk, S. L. Poliachik, S. E. Warner, T. S. Richardson, T. S. Gross (2007) *Rest-Inserted Loading Rapidly Amplifies the Response of Bone to Small Increases in Strain and Load Cycles*. Accepted for publication in Journal of Applied Physiology

J. A. Wegelin, A. Packer, and T. S. Richardson (2006). *Latent models for cross-covariance*. Journal of Multivariate Analysis, 97(1): 79-102.

M. Drton and T. S.Richardson (2004). *Multimodality of the likelihood in the bivariate seemingly unrelated regression model*. Biometrika **91**(2): 383-392.

T.S. Richardson (2003). *Markov Properties for Acyclic Directed Mixed Graphs*. The Scandinavian Journal of Statistics, March 2003, vol. 30, no. 1, pp. 145-157(13).

M. Banerjee and T.S. Richardson (2003). *On dualization of graphical Gaussian models; a correction*. The Scandinavian Journal of Statistics. March 2003, vol. 30, 817-820.

S. Lauritzen and T.S. Richardson (2002). *Chain graph models and their causal interpretations (with discussion)*. Journal of the Royal Statistical Society Series B. 64(3), 321-363.

T.S. Richardson and P.Spirtes (2002). *Ancestral graph Markov models*. Annals of Statistics. 30, 962-1030

M. Townsend and T.S. Richardson (2002). *Probability and Statistics in the Legal Curriculum: A Case Study in Disciplinary Aspects of Interdisciplinarity*. Duquesne Law Review 40(3), pp.447-488.

T. R. Hammond, G. L. Swartzman, T. S. Richardson (2001). *Bayesian estimation of fish school cluster composition applied to a Bering Sea acoustic survey*. ICES Journal of Marine Science, Vol. 58, No. 6, Nov 2001, pp. 1133-1149

J. Brutlag and T.S. Richardson (1999). *A Block Sampling Approach to Distinct Value Estimation.* Journal of Computational and Graphical Statistics. 11 (2), pp.389 – 404

R.Scheines, C.Glymour, P.Spirtes, C.Meek and T.S. Richardson (1998). *The TETRAD Project: Constraint Based Aids to Model Specification.* (with discussion) Multivariate Behavioral Research. 33(1) pp.65-118.

P.Spirtes, T.S. Richardson, C.Meek, R. Scheines, C. Glymour (1998). *Using Path Diagrams as a Structural Equation Modelling Tool.* Sociological Methods and Research, 27 (2), pp.182-225.

T.S. Richardson (1997). *A Characterization of Markov Equivalence for Directed Cyclic Graphs.* International Journal of Approximate Reasoning, 17, 2/3 (Aug-Oct. 97), pp.107-162,.

G.Cooper, C.Aliferis, R.Ambrosino, J.Aronis, B.Buchanan, R.Caruana, M.Fine, C.Glymour, G.Gordon, B.Hanusa, J.Janosky, C.Meek, T.Mitchell, T.S.Richardson, P.Spirtes (1997). *An Evaluation of Machine-Learning Methods for Predicting Pneumonia Mortality*. Artificial Intelligence and Medicine, 9, pp.107-138.

REFEREED CONFERENCE PAPERS

A. Ali, T. S. Richardson, P. Spirtes, J. Zhang. (2005). *Towards characterizing Markov equivalence classes for directed acyclic graphs with latent variables*. Proceedings of the Twenty-First Conference on Uncertainty in Artificial Intelligence. (F. Bacchus and T. Jaakkola Eds), p.10-17

M. Drton, T.S. Richardson (2004). *Iterative Conditional Fitting for Gaussian Ancestral Graph Models*. Proceedings of the Twentieth Conference on Uncertainty in Artificial Intelligence, 130-137. (Outstanding student paper award).

M. Drton, T.S. Richardson (2003). *A new algorithm for maximum likelihood estimation in Gaussian graphical models for marginal independence*. Proceedings of the Nineteenth Conference on Uncertainty in Artificial Intelligence, pp. 184-191

S. Chaudhuri, T.S, Richardson (2003). *Using the structure of d-connecting paths as a qualitative measure of the strength of dependence*. Proceedings of the Nineteenth Conference on Uncertainty in Artificial Intelligence, 116-123.

A. Ali, T.S. Richardson (2002). *Markov equivalence classes for maximal ancestral graphs*. In Proceedings of the Eighteenth Conference on Uncertainty in Artificial Intellgience. pp.1-9.

A. Ali, A. Murua, T.S. Richardson, S. Roy (2001). *A Comparison of Traditional Methods and Sequential Bayesian Methods for Blind Deconvolution Problems*. 27 pp. *Proceedings, EUSIPCO 2002*.

J. A. Wegelin, T.S. Richardson (2001). *Cross-covariance modelling via DAGs with hidden variables*. Proceedings of the 17th Conference on Uncertainty and Artificial Intelligence. pp.546-553

T.S. Richardson, H. Bailer and M. Banerjee (1999). *Tractable Structure Search in the Presence of Latent Variables*. In Proceedings of Artificial Intelligence and Statistics '99 (D. Heckerman and J. Whittaker, eds.), Morgan Kaufmann, San Francisco, CA, pp.142-151.

G. Ridgeway, D. Madigan, and T.S. Richardson (1999). *Boosting Methodology for Regression Problems*. In Proceedings of Artificial Intelligence and Statistics '99 (D. Heckerman and J. Whittaker, eds.), Morgan Kaufmann, San Francisco, CA, pp. 152-161.

G.Ridgeway, D.Madigan, T.S. Richardson, and J.O'Kane (1998). *Interpretable Boosted Naive Bayes Classification*. In Proceedings of the Fourth International Conference on Knowledge Discovery and Data Mining. (R. Agrawal, P. Stolorz, G. Piatetsky-Shapiro, eds.), pp. 101-104.

T.S. Richardson (1997). *Extensions of Undirected and Acyclic, Directed Graphical Models*. In Proceedings of Artificial Intelligence and Statistics '97, (D. Madigan and P. Smyth, eds.), pp.407-419.

T.S. Richardson, P.Spirtes, C.Glymour (1997). *A Note on Cyclic Graphs and Dynamical Feedback Systems*. In Proceedings of Artificial Intelligence and Statistics '97, (D. Madigan and P. Smyth eds.), pp.421-428.

P.Spirtes, T.S. Richardson (1997). *A Polynomial Time Algorithm for Determining DAG Equivalence in the Presence of Latent Variables and Selection Bias*. In Proceedings of Artificial Intelligence and Statistics '97, (D. Madigan and P. Smyth eds.), pp.489-500.

P.Spirtes, T.S. Richardson, C.Meek (1997). *Heuristic Greedy Search Algorithms for Latent Variable Models*. In Proceedings of Artificial Intelligence and Statistics '97, (D. Madigan and P. Smyth eds.), pp.481-488.

T.S. Richardson (1996). *A Polynomial-Time Algorithm for Deciding Markov Equivalence of Directed Cyclic Graphical Models*. In Proceedings of the 12th Conference on Uncertainty in Artificial Intelligence, Portland, Oregon. E.Horvitz and F.Jensen (eds.), Morgan Kaufmann, San Francisco, CA, pp.462- 469.

T.S. Richardson (1996). *A Discovery Algorithm for Directed Cyclic Graphs*. In Proceedings of the 12th Conference on Uncertainty in Artificial Intelligence, Portland, Oregon, 1996. (E. Horvitz and F. Jensen eds.), Morgan Kaufmann, San Francisco, CA pp.454- 461.

P.Spirtes, C.Meek, and T.S. Richardson (1995). *Causal Inference in the Presence of Latent Variables and Selection Bias*. Proceedings of the 11th Conference on Uncertainty in Artificial Intelligence, Morgan Kaufmann, San Francisco, CA, pp. 482-487.

T.S. Richardson (1994). *Equivalence in Non-Recursive Structural Equation Models*. In Proceedings of The 11th Symposium on Computational Statistics, COMPSTAT, 20-26 August 1994, Vienna, Austria. (R.Dutter ed.), Physica Verlag, Vienna, pp.482-487.

OTHER CONFERENCE PAPERS

E. Moodie, T.S. Richardson (2005). A new variance for recursive g-estimation of optimal dynamic treatment regimes. *Proceedings, WNAR 2005*.

A. Ali, T. Richardson (2004) Searching across Markov equivalence classes of maximal ancestral graphs. *Proceedings, JSM 2004*.

T.S. Richardson (1999). A Local Markov Property for Acyclic Directed Mixed Graphs. Proceedings, ISI Conference, Helsinki 1999, 4 pp.

T.S. Richardson, H.Bailer, M. Banerjee (1999). *Specification Searches Using MAG Models*. Proceedings, ISI Conference, Helsinki 1999, 4 pp.

REFEREED BOOK CHAPTERS

T.S. Richardson and P.Spirtes (2003). *Causal Inference via ancestral graph Markov models (with discussion)*. In *Highly Structured Stochastic Systems*, edited by Peter Green, Nils Hjort and Sylvia Richardson to be published by Oxford University Press pp.83-105.

T.S. Richardson (1998). Chain Graphs and Symmetric Associations. In Learning in Graphical Models, (M.Jordan ed.), Kluwer, (republished, 1999, MIT Press), pp.231-259.

S. Andersson, D. Madigan, M. Perlman, and T.S. Richardson (1999). *Graphical Markov Models in Multivariate Analysis*. In Multivariate Analysis, Design of Experiments, and Survey Sampling, (S. Ghosh ed.), Marcel Dekker.

OTHER BOOK CHAPTERS

T.S. Richardson, L.Schulz, A.Gopnik (2007) *Data-mining probabilists or experimental determinists? : A Dialogue on the Principles underlying Causal Learning in Children*. In *Causal Learning: Psychology, Philosophy and Computation* (A.Gopnik, L.Schulz eds.) Oxford: Oxford University Press.

T.S. Richardson, P.Spirtes (1999). *Automated discovery of linear feedback models*. In Computation, Causation and Discovery, (C.Glymour and G.Cooper eds.), MIT Press, pp.253-302.

R. Scheines, C. Glymour, P. Spirtes, C. Meek and T.S. Richardson (1999). *Truth is among the best explanations: Finding causal explanations of conditional independence and dependence*. In Computation, Causation and Discovery, (C. Glymour and G. Cooper eds.), MIT Press, pp.167-209.

P.Spirtes, C. Meek, T.S. Richardson (1999). *An algorithm for causal inference in the presence of latent variables and selection bias.* In Computation, Causation and Discovery (C.Glymour and G.Cooper eds.), MIT Press, pp.211-252.

DISCUSSIONS

J. Robins, T.J. vanderWeele, T.S. Richardson (2007). Comment on *Causal effects in the presence of non compliance a latent variable interpretation* by A. Forcina. Metron LXIV (3) pp.288-298.

T.S. Richardson (2004) Contribution to discussion of paper on Ecological Inference by J. Wakefield. Journal of the Royal Statistical Society, 167(3) Ser A.

C. Glymour, P. Spirtes and T.S. Richardson (1999). *On the possibility of inferring causation from association without background knowledge*. A response to a paper by J. Robins and L. Wasserman, and reply to a rejoinder. In Computation, Causation and Discovery, (C.Glymour and G.Cooper eds.), MIT Press, pp.323-332, pp.343-345.

T.S. Richardson (1999). Discussion of *Computationally Efficient Methods for Selecting Among Mixtures of Graphical Models*, by B. Thiesson, M. Chickering, D. Heckerman, and C. Meek. Bayesian Statistics 6, to appear 1999.

G. Ridgeway, T.S. Richardson, and D. Madigan (1999). Discussion of *Bump Hunting in High-Dimensional Data* by J. Friedman and N. Fisher. Statistics and Computing, 9(2), pp.150-152.

BOOK REVIEW

T.S. Richardson (1997). Review of *An Introduction to Bayesian Networks* by F.V. Jensen. Journal of the American Statistical Association, 92 (439) pp.1215-1216.

BOOKS EDITED

T. Jaakkola, T.S. Richardson (2001) Proceedings of the Eighth International Conference on Artificial Intelligence and Statistics. Morgan Kaufmann.

R. Dechter, T.S. Richardson (2006) Proceedings of the Twenty-Second Conference on Uncertainty and Artificial Intelligence. AUAI Press.

EDITORIAL

T.S. Richardson (2000). *Prediction and Model Selection*. Statistics and Computing.

TECHNICAL REPORTS & SUBMITTED PAPERS

S. Chaudhuri, T.S. Richardson , J. Robins, and E. Zivot (2007). Split-Sample Score Tests in Linear Instrumental Variables Regression. CSSS Working paper no.73. Submitted to *Econometric Theory*.

E. Moodie, T.S. Richardson (2007). Bias Correction in Non-Differentiable Estimating Equations for Optimal Dynamic Regimes. COBRA Preprint Series. Article 17. Submitted to *Scandinavian Journal of Statistics*.

M. Miyamura, T.S. Richardson (2006). Bi-partial covariances and Gaussian ancestral graph models. Submitted to *Probability Theory and Related Fields*.

M. Drton, M. Eichler, T.S. Richardson (2006). Identification and likelihood inference for recursive linear models with correlated errors. arXiv:math.ST/0601631. Submitted to *JASA*.

T.S. Richardson (2006) A factorization criterion for ancestral graphs. Work in progress.

M. Drton, T.S. Richardson (2004). Graphical Answers to Questions About Likelihood Inference in Gaussian Covariance Models. Department of Statistics, University of Washington, Tech. Report 467.

D. Heckerman, C. Meek, T.S. Richardson (2004) Variations on undirected graphical models and their relationships. Unpublished Technical Report.

A. Ali, T.S. Richardson and P. Spirtes (2004) *Markov Equivalence for Ancestral Graphs*. Department of Statistics, University of Washington, Tech. Report 464.

J. A. Wegelin, T.S. Richardson and D. L. Ragozin (2001). *Rank-One Latent Models for Cross-Covariance*. UW Department of Statistics, Technical Report, No. 391, 29 pp.

T.S. Richardson (2001) *Chain graphs which are maximal ancestral graphs are recursive causal graphs*. UW Department of Statistics, Technical Report, No. 387, 13 pp.

N. Wermuth, D.R. Cox, T.S. Richardson and G. Glonek (1999). *On transforming and generating cyclic graph models*. ZUMA Technical Report. 12 pp.

T.S. Richardson (1996). *Fast re-calculation of the covariance matrix implied by a recursive structural equation model*. Technical Report, CMU-PHIL-67, 9 pp.

P.Spirtes, T.S. Richardson, C.Meek, R.Scheines and C.Glymour (1996). *Using d-separation to calculate zero partial correlations in linear models with correlated errors*., Technical Report, CMU-PHIL-72. 17pp.