

CURRICULUM VITAE

MARK EDWARD IRWIN

EDUCATION:

- 1989 – 1994 Ph. D. University of Chicago (Statistics).
- 1987 – 1989 M. Sc. University of British Columbia (Statistics).
- 1982 – 1986 B. Sc. (Honours) University of British Columbia (Mathematics).

EMPLOYMENT:

- 2012 – 2016 Senior Statistician, Data Science, MillwardBrown Digital (previously Compete)
- 2009 – 2012 Director of Marketing Science, in4mation insights
- 2008 – 2010 Editor, Adaptive Technology Laboratory, Harvard University (Spherion)
- 2003 – 2006 Lecturer, Department of Statistics, Harvard University
- 2000 – 2003 Statistical Computing Scientist, Department of Statistics, Ohio State University
- 1995 – 2000 Assistant Professor, Department of Statistics, Ohio State University
- 1993 – 1994 Lecturer, Department of Statistics, Ohio State University
- 1992 – 1993 Research Assistant, Department of Statistics, University of Chicago.
- 1991, 1993 Instructor, Department of Statistics, University of Chicago.
- 1991 Research Assistant, Dr. R. Thisted.
- 1989 – 1992 Teaching Assistant, Department of Statistics, University of Chicago.
- 1986 – 1989 Research Assistant, Department of Medical Genetics, University of British Columbia.
- 1987 Tax Preparer, H & R Block
- 1986 Research Assistant, Department of Statistics, University of British Columbia.
- 1985 – 1986 Undergraduate Teaching Assistant, Department of Mathematics, University of British Columbia.

PROFESSIONAL SOCIETIES:

- American Statistical Association

HONOURS:

- 1992 University of Chicago, Department of Statistics Consulting Award
- 1989 – 1992 University of Chicago McCormick Fellowship.
- 1982 – 1986 Hon. W.C. Woodward University Memorial Scholarship.
- 1982 University of British Columbia Scholarship Fund.
- 1982 Province of British Columbia Grade Twelve Scholarship Award.

PRESENTATIONS:

INVITED TALKS:

- Irwin ME. Sequential Imputation and Multi-locus Linkage Analysis. For the Department of Genetic Epidemiology, University of Utah, February 1993.

- Irwin ME. Sequential Imputation and Multi-locus Linkage Analysis. For the Department of Biostatistics, University of Wisconsin, April 1993.
- Irwin ME. Sequential Imputation and Multi-locus Linkage Analysis. For the Department of Statistics, Ohio State University, April 1993.
- Irwin ME. Sequential Imputation and Multi-locus Linkage Analysis. For the Department of Statistics, University of British Columbia, June 1994.
- Irwin ME. Sequential Imputation and Multi-locus Linkage Analysis. For the Department of Statistics, University of Chicago, October 1994.
- Irwin ME. Efficient Imputation in Linkage Analysis. Presented at Joint Statistical Meetings, August 1995.
- Irwin ME. Efficient Imputation in Linkage Analysis. For the Department of Statistics, Pennsylvania State University, August 1995.
- Irwin ME. Efficient Imputation in Linkage Analysis. For the Department of Mathematics and Statistics, Queen's University, September 1995.
- Irwin ME. Reweighted Monte Carlo EM Algorithms. For the Cleveland Clinic Foundation, Case Western Reserve, and Ohio State University Annual Joint Symposium, May 1996.
- Irwin ME. Pedigree Reconstruction with Partial Genetic Information. Presented at the Joint Statistical Meetings, August 1998.
- Irwin ME. Pedigree Reconstruction with Partial Genetic Information. For the Department of Statistics, Purdue University, October 1998.
- Irwin ME. Spatial-temporal Nonlinear Filtering in Command and Control (C2). Presented at the 34th Symposium on the Interface: Computing Science and Statistics, April 2002.
- Irwin ME. Linkage Analysis by Sequential Imputation. For the Department of Biostatistics, University of North Carolina at Chapel Hill, October 2002.
- Cressie N, Irwin ME, and Kornak J. Particle Filtering and Spatial Prediction in the Battlespace. Presented at the U.S. Army Conference on Applied Statistics, October 2002.
- Irwin ME. Nonparametric Linkage Analysis Via Sequential Imputation. For the Department of Statistics, Harvard University, May 2003.
- Irwin ME. Spatial point process models of defensive strategies: Detecting changes. Los Alamos National Laboratory, March 2005.

HARVARD UNIVERSITY DEPARTMENTAL SEMINARS:

Irwin ME. Spatial point process models of defensive strategies: Detecting changes. December 2004.

OHIO STATE UNIVERSITY DEPARTMENTAL SEMINARS:

Irwin ME. Examining Likelihoods and Posteriors with Sequential Imputation, January 1995.

Irwin ME. Pedigree Reconstruction with Partial Genetic Information. April 1999.

Irwin ME. Reweighted Monte Carlo EM Algorithms. April 2000.

Irwin ME. Spatial-temporal Nonlinear Filtering in Command and Control. March 2002.

CONTRIBUTED PAPER TALKS:

Kan L, Wiggs B, Irwin M, and Yee I. Case Studies in Data Analysis. Presented at Annual Meeting of the Statistical Society of Canada, Victoria, British Columbia, May 1988.

Sadovnick AD, Irwin ME, Baird PA, and Beattie BL. Familial risks for Alzheimer's disease: data from an unselected population. Presented at Annual Meeting of the American Society of Human Genetics, October 1988.

Bamforth SJ, Irwin ME, and Baird PA. Spina Bifida and hydrocephalus: A population study over a 33 year period. Presented at Annual Meeting of the American Society of Human Genetics, October 1988.

Irwin ME, Sadovnick AD, Baird PA, and Beattie BL. Familial Risks in Alzheimer's Disease: Data for an Unselected Population. Presented at Second International Symposium on Familial Alzheimer's Disease, Seattle, Washington, May 1989. (ABSTRACT: Alzheimer Disease and Associated Disorders Vol 3 Suppl 1 p 10).

Irwin ME. Estimation of Familial Risks in Adult Onset Diseases. Presented at Annual Meeting of the Statistical Society of Canada, Ottawa, Ontario, June 1989.

Kong A, Irwin M, Cox N, and Frigge M. Multi-Locus Problems and the Method of Sequential Imputations. Presented at Genetics Analysis Workshop 8, Watsonville, California, November 1992

Irwin ME. Sequential Imputation and Multi-locus Linkage Analysis. Presented at the Joint Statistical Meetings, San Francisco, California, August 1993.

Irwin ME. Increasing the Efficiency of Monte Carlo EM Algorithms. Presented at the 2nd IMS North American New Researchers' Meeting, Kingston, Ontario, July 1995.

Rieder JP, Parker PG, Spotila JR, and Irwin ME. The Mating System of the Leatherback Turtle (*Dermodochelys Coriacea*): A Molecular Approach. Presented at the International Symposium on Sea Turtle Biology and Conservation, February 1996.

- Peare T, Parker PG, and Irwin ME. Paternity Analysis in Green Turtles. Presented at the International Symposium on Sea Turtle Biology and Conservation, February 1996.
- Irwin ME. Reweighted Monte Carlo EM Algorithms. Presented at the Joint Statistical Meetings, Chicago IL, August 1996
- Irwin ME. Pedigree Reconstruction with Partial Genetic Information. Presented at the 3rd IMS North American New Researchers' Meeting, Laramie, Wyoming, July 1997.
- Irwin ME. Pedigree Reconstruction with Partial Genetic Information. Presented at the IMS Annual Meeting, Park City, Utah, July 1997.
- Lin S, Irwin ME, Wright FA. An Analysis of the COGA Dataset. Presented at Genetics Analysis Workshop 11, Arcachon, France, September 1998.
- Wright FA, Berry C, Irwin ME, Lin S. Allele Sharing: Testing and Modelling in a Simulated Dataset. Presented at Genetics Analysis Workshop 11, Arcachon, France, September 1998.
- Luo Y, Lin S, and Irwin ME.. Two-locus Modeling of Asthma in a Hutterite Pedigree via Markov Chain Monte Carlo. Presented at Genetics Analysis Workshop 12, San Antonio, Texas, October 2000.
- Wang D, Gao X, Lin S, Skrivanek Z, Irwin ME, and Wright FA. Comparison of Several Methods for Linkage Analysis. Presented at Genetics Analysis Workshop 12, San Antonio, Texas, October 2000.
- Irwin ME, Cressie N, and Johannesson G. Spatial-temporal Nonlinear Filtering in Command and Control (C2). Presented at First Cape Cod Workshop on Monte Carlo Methods, September 2002.
- Biswas S, Papachristou C, Irwin ME, Lin S. Linkage Analysis of the Simulated Data – Evaluations and Comparisons of Methods. Presented at Genetics Analysis Workshop 13, New Orleans, November 2002.
- Irwin ME, Wendt DA, Cressie N. Waypoint Analysis for Command and Control. Presented at the 35th Symposium on the Interface: Computing Science and Statistics, Salt Lake City, March 2003.
- Alexandridis RA, Lin S, and Irwin M. Discovery and Classification of Cancer Types Using Gene Expression Analysis. Presented at Annual Meeting of the American Society of Human Genetics, Los Angeles, November 2003.
- Irwin ME, Phansalkar A. Clustering Analysis of Clickstream Data in Consumer Path to Purchase. Presented at the Joint Statistical Meetings, August 2013.

GRANT FUNDING:

Efficiency of Sequential Imputation for Linkage Analysis. Ohio State University Seed Grant, 1996. Funded for \$9655.

OTHER GRANT APPLICATIONS:

Parker PG, Waite TA, Irwin ME, Spotila JR. Sex Ratios, Mating Systems and the Viability of Marine Turtle Population. Submitted to the National Science Foundations program of Biological Oceanography, August 1996.

Spotila JR, O'Connor MP, Parker PG, Waite TA, Irwin ME. Collaborative Research: Sex Ratio, Mating Systems, and Viability of Marine Turtle Populations. Submitted to the National Science Foundations program of Biological Oceanography, August 1997

Weghorst C, Wani AA, Casto B, Irwin ME. Methods for Discovering and Scoring Single Nucleotide Polymorphisms. Submitted to the National Institutes of Health, May 1998.

Wright FA, Irwin ME, Lin S, Krahe R. Statistical Methods for Cancer Genetic Research. Submitted to the National Institutes of Health. January 1999.

Wright FA, Irwin ME, Lin S, Krahe R. Statistical Methods for Cancer Genetic Research. Submitted to the National Institutes of Health. February 2000.

Peruggia M, Suratt PA, Irwin ME. Statistical Modeling and Analysis of Sleep Studies (Polysomnography). Submitted to the National Institutes of Health, February 2001.

Lin S, Irwin ME, Fernandez S. Monte Carlo Methods for Gene Mapping. Submitted to the National Institutes of Health, June 2002.

PUBLICATIONS:

PAPERS IN REFEREED JOURNALS:

Sadovnick AD, Irwin ME, Baird PA, and Beattie BL (1989): Genetic Studies on an Alzheimer Clinic Population. *Genetic Epidemiology*, 6:633-643.

Kan L, Wiggs B, Irwin M, and Yee I (1990): Acute Respiratory Health Effects in Asthmatic and Non-asthmatic Children Associated with Short Term Exposure to Air Pollutants. *Canadian Journal of Statistics*, 18:373-377.

Kong A, Frigge M, Irwin M, and Cox N (1992): Importance Sampling (I): Computing Multimodel p-values in Linkage Analysis. *American Journal of Human Genetics*, 51:1413-1429.

Kong A, Irwin M, Cox N, and Frigge M (1993): Sequential Imputations and Multi-point Analysis. *Genetic Epidemiology*, 10:483-488.

- Roizen NJ, Blondis TA, Irwin M, and Stein M (1994): Adaptive Functioning in Children With Attention-Deficit Hyperactivity Disorder. *Archives of Pediatrics & Adolescent Medicine*, 148: 1137-1142.
- Irwin M, Cox N, and Kong A. (1994). Sequential Imputation for Multilocus Analysis. *Proceedings of the National Academy of Sciences of the U.S.A.*, 91: 11684-11688.
- Roizen NJ, Blondis TA, Irwin M, Rubinoff A, Kieffer J, and Stein MA. (1996). Psychiatric and Developmental Disorders in Families of Children with Attention-Deficit Hyperactivity Disorder. *Archives of Pediatrics & Adolescent Medicine*, 150: 203-208.
- Arnow PM, Carandang GC, Zabner R, and Irwin ME (1996). A Randomized Controlled Trial of Selective Bowel Decontamination to Prevent Infections After Liver Transplantation. *Clinical Infectious Diseases*, 22: 997 - 1003.
- Toljanic JA, Siddiqui AA, Patterson GL, Irwin ME, Shapiro RD, and Hurst PS (1996) . An Evaluation of a Dentifrice Containing Salivary Peroxidase Elements for the Control of Gingival Disease in Irradiated Head and Neck Cancer Patients. *Journal of Prosthetic Dentistry*, 76: 292 - 296.
- Bollmer JL, Irwin ME, Rieder JP, and Parker PG (1999). Multiple Paternity in Loggerhead Turtle Clutches. *Copeia*, 99:475 - 478.
- Lin S, Irwin ME, and Wright FA (1999). A Multiple Locus Analysis of the COGA Dataset. *Genetic Epidemiology*, 17 (Suppl 1): S229 – S234.
- Luo Y, Lin S, and Irwin ME (2001). Two-locus Modeling of Asthma in a Hutterite Pedigree via Markov Chain Monte Carlo. *Genetic Epidemiology*, 21 (Suppl 1): S24 – S29.
- Irwin ME, Cressie N, and Johannesson G (2002). Spatial-temporal nonlinear filtering based on hierarchical statistical models (with discussion). *Test*, 11: 249-302.
- Biswas S, Papachristou C, Irwin ME, Lin S (2003). Linkage Analysis of the Simulated Data – Evaluations and Comparisons of Methods. *BMC Genet* 2003, 4(Suppl I): S70.
- Lin S, Skrivanek Z, and Irwin ME (2003). Haplotyping Using SIMPLE - Caution on Ignoring Interference. *Genetic Epidemiology*, 25: 384-387.
- Skrivanek Z, Lin S, and Irwin ME (2003). Linkage Analysis with Sequential Imputation. *Genetic Epidemiology*, 25: 25-35.
- Alexandridis R, Lin S, and Irwin M (2004). Class Discovery and Classification of Tumor Samples Using Mixture Modeling of Gene Expression Data. *Bioinformatics*, 20: 2545-2552.
- Wendt DA, Irwin ME, and Cressie N (2004). Waypoint Analysis for Command and Control. *Naval Research Logistics*, 51: 1045-1067.

McMillan N, Bortnick SM, Irwin ME, and Berliner LM (2005). A Hierarchical Bayesian Model to Estimate and Forecast Ozone Through Space and Time. *Atmospheric Environment*, 39: 1373-1382

Kornak J, Irwin ME, and Cressie N (2006). Spatial Point Process Models of Defensive Strategies: Detecting Changes. *Statistical Inference for Stochastic Processes*, 9: 31 - 46.

SUBMITTED TO REFEREED JOURNALS:

OTHER:

Irwin ME (1989). Empiric Risk Estimation in Alzheimer Disease. Masters Thesis, Department of Statistics, University of British Columbia.

Kong A , Frigge M, Irwin M, and Cox N (1992). Importance Sampling (I): Computing Multimodel p-values in Linkage Analysis. Technical Report No. 337, Department of Statistics, University of Chicago.

Kong A, Irwin M, Cox N, and Frigge M (1992). Multi-Locus Problems and the Method of Sequential Imputations. Technical Report No. 351 , Department of Statistics, University of Chicago .

Irwin ME (1994). Sequential Imputation and Multilocus Linkage Analysis. PhD Thesis, Department of Statistics, University of Chicago.

Irwin ME (1998). Simpson's Paradox: What Can Happen if you Ignore an Important Variable. *Biostat News*, 2: 2. (Newsletter for the Biostatistics Program at The Ohio State University)

Irwin ME, Cressie N, and Johannesson G (2002). Spatial-temporal nonlinear filtering in Command and Control (C2). Technical Report No. 697, Department of Statistics, The Ohio State University.

Wendt DA, Irwin ME, and Cressie N (2002). Waypoint Analysis for Command and Control. Technical Report No. 691, Department of Statistics, Ohio State University.

Kornak J, Irwin ME, and Cressie N (2003). Spatial Point Process Models of Defensive Strategies: Detecting Changes. Technical Report No. 713, Department of Statistics, Ohio State University.

IN PREPARATION:

OTHER PROFESSIONAL ACTIVITIES

President, Columbus Chapter of the American Statistical Association, 1996 - 1999

Referee for *The American Statistician*, 1998

Referee for *Genetic Epidemiology*, 2000

Referee for SERRA, 2000

Referee for Journal of Biopharmaceutical Statistics, 2001

Referee for the American Journal of Human Genetics, 2003

Referee for Journal of Computational and Graphical Statistics, 2003

Referee for JASA, 2004

Textbook reviewer for John Wiley & Sons, 1998

Textbook reviewer for W.H. Freeman and Company, 2004

Textbook reviewer for Springer Verlag, 2005

Judge for the Math and Physical Sciences Scholarship at State of Ohio Science Day, April 1995.

Judge for the Ohio State University Graduate Research Forum, April 1996

Judge for the Statistical Analysis Award at State of Ohio Science Day, April 1997.

Judge for the Statistical Analysis Award at State of Ohio Science Day, April 1998.

Judge for the Statistical Analysis Award at State of Ohio Science Day, April 1999.

Judge for the Statistical Analysis Award at State of Ohio Science Day, April 2000.

Judge for the Statistical Analysis Award at State of Ohio Science Day, April 2001.

Judge for the Statistical Analysis Award at State of Ohio Science Day, April 2003.

HARVARD UNIVERSITY INFORMATION:

TEACHING (number of students in parentheses):

| <u>Year</u> | <u>Autumn</u> | <u>Spring</u> | <u>Summer</u> |
|-------------|---|---------------------|---------------------|
| 2003 – 2004 | Statistics 104 (103) Statistics 335 (17) | Statistics 221 (9) | Statistics 110 (13) |
| 2004 – 2005 | Statistics 104 (120) | Statistics 220 (30) | Statistics 110 (10) |
| 2006 – 2006 | Statistics 135 | Statistics 149 | Statistics 110 (7) |

COURSE ADVISING:

2004 – 2005 Christopher Chiambalero, Jane Paik

DEPARTMENTAL COMMITTEES:

2003 – 2004 Graduate Admissions

2004 – 2005 Computing Committee
Graduate Admissions
Faculty Hiring Committee

2005 – 2006 Computing Committee
Graduate Admissions
Faculty Hiring Committee

OHIO STATE UNIVERSITY INFORMATION:

TEACHING (number of students in parentheses):

| <u>Year</u> | <u>Autumn</u> | <u>Winter</u> | <u>Spring</u> |
|-------------|--|--|--|
| 1993 – 1994 | Biostatistics 615 (12) | Statistics 135 (104) | Statistics 135 (169) Statistics 530 (43) |
| 1994 – 1995 | Statistics 528 (40) Biostatistics 615 (24) | Statistics 529 (35) | Statistics 530 (24) |
| 1995 – 1996 | Biostatistics 615 (17) Statistics 693 (1) | Statistics 145 (98) Statistics 529 (37) | Statistics 145 (123) |
| 1996 – 1997 | Statistics 145 (133) Statistics 893 (9) | Statistics 641 (32) | Statistics 530 (22) |
| 1997 – 1998 | Statistics 428 (34) | Statistics 428 (39) Statistics 641 (25) | Statistics 645 (12) |
| 1998 – 1999 | Biostatistics 615 (15) | Statistics 529 (19) Statistics 693 (1) Statistics 999 (1) | Statistics 529 (19) Statistics 645 (35) Statistics 999 (1) |
| 1999 – 2000 | Biostatistics 615 (25) Statistics 693 (2) Statistics 999 (1) | Statistics 528 (38) Statistics 645 (23) Statistics 999 (1) | Statistics 530 (16) |

ADDITIONAL TEACHING:

- 1998 – 1999 Short course on Multiple Regression for Biostatistics Program
- 2000 – 2001 Statistical Computing Short Courses
- 2001 – 2002 Statistical Computing Short Courses, Introduction to Survival Analysis for REU students

DEPARTMENTAL COMMITTEES:

- 1993 – 1994 MS exam committee
- 1994 – 1995 MS exam committee
- 1995 – 1996 Computer Advisory committee
MAS exam committee
- 1996 – 1997 Graduate Admissions committee
MAS exam committee
Minor exam committee (Chair)
- 1997 – 1998 MAS exam committee

- Minor exam co-ordinator (Chair)
- 1998 – 1999 MAS exam committee
Minor exam co-ordinator (Chair)
- 1999 – 2000 MAS exam committee
- 2000 – 2001 Computer Advisory committee
Ad hoc Web site redesign committee
- 2001 – 2002 Computer Advisory committee
Ad hoc Web site redesign committee
- 2002 – 2003 Computer Advisory committee

UNIVERSITY COMMITTEES:

- 1996 – 1999 Arts and Sciences Faculty Senate (Alternate)

STATISTICS Ph.D. COMMITTEES:

- 1995 – 1997 Teresa Papa
- 1996 – 1998 Richard Scott Linder
- 1997 – 1998 Xiong Hu (General Exam Committee)
- 1998 – 2002 Zachary Skrivanek
- 1998 – 2002 Yuqun Luo
- 1999 – 2000 Iyue Sung
- 2001 – 2003 Roxana Alexandridis
- 2002 – 2003 Swati Biswas

NON-STATISTICS Ph.D. COMMITTEES:

- 1994 Chandrika Jayathirtha, Family Resource Management (General Exam Committee)
- 1995 Virginia Solis Zuiker, Family Resource Management (General Exam Committee)
- 1995 – 1997 Anita Subramaniam, Family Resource Management
- 1996 Mark Geil, Biometical Engineering (General Exam Committee)

NON-STATISTICS M.Sc. COMMITTEES:

1998 – 2000 Andrew Burt, Zoology

COURSE ADVISING:

1994 – 1995 Jon Ogle, Matt Palmgren, Loraine Sinnott

1995 – 1996 John Kindelberger, Matt Palmgren, Vera Wirawan

1996 – 1997 John Kindelberger, Qun Liu, Vera Wirawan

1997 – 1998 Qun Liu, Tadashi Koga.

1998 – 1999 Tadashi Koga, Leigh Weiss.

1999 – 2000 Leigh Weiss