

BIOGRAPHICAL SKETCH

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NAME Elizabeth A. Thompson	POSITION TITLE Professor of Statistics		
eRA COMMONS USER NAME ETHOMPSON			
EDUCATION/TRAINING <i>(Begin with baccalaureate or other initial professional education, such as nursing, and include postdoctoral training.)</i>			
INSTITUTION AND LOCATION	DEGREE <i>(if applicable)</i>	YEAR(s)	FIELD OF STUDY
Cambridge University, England	B.A. (hons)	1967-70	Mathematics
Cambridge University, England	Diploma	1970-71	Mathematical Statistics
Cambridge University, England	M.A.	1974	Mathematics
Cambridge University, England	Ph.D	1971-74	Statistics
Stanford University, Stanford, CA	postdoc	1974-75	Genetics

Please refer to the application instructions in order to complete sections A, B, and C of the Biographical Sketch.

A. Positions and Honors

Positions and Employment

- 1975--78 Research fellow, King's College, Cambridge
1976--85 University Lecturer, Department of Pure Mathematics and Mathematical Statistics, Cambridge University (tenured from March 1979)
1978--81 Official Fellow and Financial Tutor, King's College, Cambridge
1981--85 Official Fellow, College Lecturer and Director of Studies in Mathematics, Newnham College, Camb.
1985(Dec)-- Professor, Department of Statistics, University of Washington (Chair, 1989-1994)
1988--2004 and Professor, Department of Biostatistics,
2000--2006 and Adjunct Professor of Statistics, North Carolina State University
2000-- and Adjunct Professor of Genome Sciences (until 2001, Genetics), University of Washington
2006-- and Adjunct Professor of Biostatistics, University of Washington

Other major professional experience

- 1975,77 Visiting Scholar, Human Genetics, Univ. of Michigan, Ann Arbor (3/75-5/75, 6/77-9/77)
1976 Visiting Research Consultant, University of Utah (6/76-8/76)
1978 Visiting Scientist, University of Utah (4/78-9/78)
1979-81 Member, Electors to Fellowships, King's College, Cambridge
1984-86 Faculty Board of Mathematics, University of Cambridge.
1988 Consultant, DMS Inc., Salt Lake City, Utah (12/87-3/88)
1992 Visiting Professor, Rutgers University (Center for Theoretical and Applied Genetics) (12/91-3/92)
1994-1997 Member, NRC Committee of Applied and Theoretical Statistics
1995-2005 Member, Program in Mathematics and Molecular Biology
1998 President, West North American Region of the International Biometric Society
1997-2000 Member, Technology Working Group of the NIJ panel on Forensic DNA
1997-2001 Member of Council, International Statistical Institute
2002-2003 Visiting Professor of Statistics, North Carolina State University
2005-2009 Member of Scientific Advisory Board, Banff International Research Station
2006-2009 Member of Council, International Biometric Society
2006 Visiting Rothschild Professor, University of Cambridge, UK. (Nov-Dec)

Academic Honors

- 1968--74 Prizes, scholarships and studentships, Newnham College, Cambridge
1973 Smith's Prize (for predoctoral research), University of Cambridge
1973--74 Sims Scholarship, University of Cambridge
1975 Stott Prize (for postdoctoral research), Newnham College
1974--78 Elected to Junior Research Fellowship, King's College, Cambridge

- 1978--82 Elected to Senior Research Fellowship, King's College, Cambridge
- 1981 Elected to **International Statistical Institute**
- 1988 Awarded Doctor of Science degree, University of Cambridge.
- 1994 R.A.Fisher Lecturer, Joint Statistical Meetings, Toronto.
- 1996 Neyman Lecturer (IMS), Joint Statistical Meetings, Chicago.
- 1998 Elected to **American Academy of Arts and Sciences**.
- 2001 Jerome Sacks award for cross-disciplinary research, National Institute for Statistical Sciences
- 2001 Weldon Prize for contributions to Biometric Science, awarded by University of Oxford
- 2002-03 Guggenheim Fellow for period 09/2002- 03/2003
- 2005 Mary Cartwright Lecturer, London Mathematical Society, UK
- 2006 Distinguished Lecturer in Statistical Science, Fields Institute, Toronto.
- 2006 XXVII Fisher Memorial Lecture, Cambridge, UK
- 2008 Elected to the **US National Academy of Sciences**

B. Selected Peer Reviewed Publications (in chronological order)

Publications selected from 4 books and 205 papers, not including abstracts.

1. Thompson, E.A. (1974) Gene identities and multiple relationships. *Biometrics* **30**: 667—680. PMID: 4429760
2. Thompson, E. A. (1975) *Human Evolutionary Trees*. Cambridge University Press.
3. Thompson, E.A. (1975) The estimation of pairwise relationship. *Ann. Hum. Genet.* **39**: 173—188. PMID: 1052764.
4. Thompson, E.A. (1978) The number of ancestral haplotypes contributing to a sample of B8 alleles. *Nature* **272**: 288. PMID: 628455.
5. Thompson, E.A. (1979) Fission models of population variability. *Genetics* **93**: 479—495.
6. Thompson, E.A. (1981) Pedigree analysis of Hodgkin's disease in a Newfoundland genealogy. *Ann. Hum. Genet.* **45**: 279—292. PMID: 7305282.
7. Thompson, E.A. (1983) Gene extinction and allelic origins in complex genealogies. *Proc. Roy. Soc. (Lond.) B* **219**: 241—251. PMID: 6139815.
8. Thompson, E.A. (1986) *Pedigree Analysis in Human Genetics*. Johns Hopkins University Press, Baltimore, MD.
9. Thompson E.A. (1988). Two-locus and three-locus gene identity by descent in pedigrees. *I.M.A. J. Math. Appl. in Med and Biol.* **5**: 261—280. PMID: 3241098.
10. Thompson, E. A. and Guo, S-W. (1991). Evaluation of likelihood ratios for complex genetic models. *I.M.A. J. Math. Appl. Med. & Biol.* **8**: 149—169.
11. Geyer, C.J. and Thompson, E.A. (1992). Constrained Monte Carlo maximum likelihood for dependent data (with Discussion). *J. Roy. Statist. Soc. (B)* **54**: 657—699.
12. Thompson, E. A. (1994) Monte Carlo likelihood in genetic mapping. *Statistical Science*: **9**: 355-366.
13. Geyer, C. J. and Thompson, E. A. (1995) Annealing Markov chain Monte Carlo with applications to ancestral inference. *Journal of the American Statistical Association* **90**: 909—920.
14. Thompson, E. A. and Neel, J. V. (1997) Allelic association and allele frequency distribution as a function of social and demographic history. *American Journal of Human Genetics* **60**: 197—204. PMID: 8981963.
15. Li, H., Thompson, E. A. and Wijsman, E. M. (1998) Semiparametric estimation of major gene effects for age of onset. *Genetic Epidemiology* **15**: 279—298. PMID: 9593114.
16. Graham, J. and Thompson, E. A. (2000) A coalescent model of ancestry of a rare allele. *Genetics*, **156**: 375—384. PMID: 10978301.
17. Thompson, E. A. (2000) *Statistical Inferences from Genetic Data on Pedigrees*. NSF-CBMS Regional Conference Series in Probability and Statistics. Volume 6. IMS, Beachwood, OH.
18. Sieberts, S., Wijsman, E.M. and Thompson, E. A. (2002) Relationship inference from trios of individuals in the presence of typing error. *Am. J. Hum. Genet.* **70**: 170—180. PMID: 11727198.
19. Chapman, N. H. and Thompson E. A. (2002) The effect of population history on the lengths of ancestral chromosome segments. *Genetics* **162**: 449—458.
20. Anderson, E.C. and Thompson E.A. (2002) A model-based method for identifying species hybrids using multilocus genetic data. *Genetics* **160**: 1217—1229. PMID: 11901135.
21. Thompson, E. A. and Basu, S. (2003) Genome sharing in large pedigrees: multiple imputation of *ibd* for linkage detection. *Human Heredity* **56**: 119—125.

22. George, A. W., Wijsman, E. M. and Thompson, E. A. (2005) MCMC Multilocus lod scores: Application of a new approach. *Human Heredity* **59**: 98—108. PMID: 15838179.
23. Thompson, E. A. (2005) MCMC in the analysis of genetic data on pedigrees. Chapter 4 in *Markov Chain Monte Carlo: Innovations and Applications*. F Liang, J-S Wang, and W. Kendall (eds). World Scientific Co Pte Ltd, Singapore.
24. Stewart, W. C. L. and Thompson, E. A. (2006) Improving estimates of genetic maps: A maximum likelihood approach. *Biometrics* **62**: 728—734. PMID: 16984314.
25. Thompson, E. A. and Geyer C. J. (2007) Fuzzy p-values in latent variable problems. *Biometrika* **90**: 49—60.
26. Thompson, E. A. (2007) Chapter 33: Linkage Analysis. In *Handbook of Statistical Genetics. 3rd Ed.* D.J.Balding, M. Bishop and C.Cannings (eds). Pp. 1141—1167. Wiley: Chichester, UK.
27. Thompson, E. A. (2007) 1953: An unrecognized summit in human genetic linkage analysis. *Statistical Surveys* **1**: 1—15.
28. Tong, L. and Thompson, E. A. (2008) Multilocus lod scores in large pedigrees. *Human Heredity* **65**: 142—153.
29. Thompson, E. A. (2008) Uncertainty in inheritance: assessing linkage evidence. Proceedings of the Joint Statistical Meetings, Salt Lake City 2007. Pp. 3751—3758.
30. Thompson, E. A. (2008) The IBD process along four chromosomes. *Theoretical Population Biology*: **73**: 369—373. PMID: 18282591.
31. Roychoudhury, A., Felsenstein, J., and Thompson, E.A. (2008) A two-stage pruning algorithm for likelihood computation for a population tree. *Genetics*: **180**: 1095—1105. PMID: 18780754.

C. Research Support. List selected ongoing or completed (during the last three years) research projects (federal and non-federal support). Begin with the projects that are most relevant to the research proposed in this application.

Current

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|--|-----------------------------|
| <p>R37 GM 46255 (Current Years 17-21) Thompson (PI)
NIH/NIGMS
Methods for the Genetic Epidemiology of Complex Traits
Development of computational and statistical methods, including Markov chain Monte Carlo methods, for the genetic analysis of complex traits using multilocus data on extended pedigrees. Implementation and distribution of software for these methods.
Role: PI</p> | <p>9/01/1991—11/30/2012</p> |
| <p>R01 HG 004175 Dechter (PI)
NIH/NIHGR
Efficient Software and Algorithms for Analyzing Markers Data on General Pedigrees
To develop an efficient, extensible, modular and accessible software toolbox that would facilitate statistical methods for analyzing complex pedigrees, taking into account multiple DNA markers in fully general pedigrees and using qualitative and quantitative traits and a variety of disease models.
Role: Co-investigator (UW subcontract PI)</p> | <p>7/01/2007—6/30/2010</p> |

Completed

None since December 2005.