

CURRICULUM VITAE ET STUDIORUM
PROF ERNST WIT

updated: 16/6/09

CONTACT AND PERSONAL DETAILS:

OFFICE: Institute of Mathematics and Computing Science, IWI
University of Groningen, RUG
Bernoulliborg, Rm. 446
Nijenborgh 9
9747 AG Groningen
The Netherlands
tel. +31 (0)50 - 363 5170
fax. +31 (0)50 - 363 3800

EMAIL: e.c.wit@rug.nl

HOMEPAGE: <http://www.math.rug.nl/~ernst>

NATIONALITY: Dutch

DATE OF BIRTH: April 5, 1972

CURRENT EMPLOYMENT: Chair of Statistics and Probability

PROFESSIONAL ACTIVITIES:

- Chair of Statistics and Probability, University of Groningen. The group includes 3 academics and several post-docs and PhD students.
- Associate Editor *Biostatistics*, since 2006.
- TGAC Scientific Advisory Board Member, BBSRC Genomics Centre, Norwich (since 2009).
- Steering Committee Member, ARK-Genomics Roslin, University of Edinburgh.
- A regular *reviewer* for grant applications and is a regular referee for *Bioinformatics*, *Biometrics*, *Biometrika*, *JRRS-C*, *JRSS-B* and *Biostatistics*.
- External examiner, M.Sc. Statistics, School of Mathematics, University of Leeds.

PAST PROFESSIONAL ACTIVITIES:

- Honorary Secretary, Research Section, Royal Statistical Society (2006–2008).
- Associate Editor *JRSS-C* (2002–2006).
- Chair of EPSRC Grant Review Committee, September 2007.

EMPLOYMENT RECORD:

- 1 June, 2008 – current, Chair of Statistics and Probability, University of Groningen.
- 1 January, 2006 – 31 May, 2008, Chair in Biometrics, Department of Maths and Stats, Lancaster University.
- 1 July, 2004 – 31 December, 2005, Reader in Statistics, University of Glasgow.
- 1 September, 2000 – 30 June, 2004, Lecturer in Statistics, University of Glasgow.
- 1 August, 1998 – 1 January, 1999, Visiting fellow at the Department of Statistics in the School of Mathematics, University of New South Wales, Sydney, Australia.
- 1 January, 1995 – 1 June, 1997, Instructor at the Department of Statistics, Pennsylvania State University, USA.
- 1 September, 1991 – 1 June, 1994, Teaching assistant in the Department of Mathematics, Vrije Universiteit, Amsterdam, Netherlands.

EDUCATION:

- DOCTOR OF PHILOSOPHY in Statistics at the University of Chicago, USA. Advisor: Peter McCullagh. August 2000.
- DOCTOR OF PHILOSOPHY in Philosophy at the Pennsylvania State University, USA. Advisor: Joseph Kockelmans. May 1997.
- MASTER OF ARTS in Philosophy of Science at the Vrije Universiteit, Amsterdam, Netherlands. Advisor: Peter Kirschenman. July 1997.
- MASTER OF ARTS in Philosophy at the Vrije Universiteit, Amsterdam, Netherlands. Advisor: Henk Woldring. June 1997.
- MASTER OF SCIENCE in Mathematics at the Vrije Universiteit, Amsterdam, Netherlands. Advisor: Aad van der Vaart. June 1994.

MEMBERSHIPS:

- *Royal Statistical Society, Statistical Modelling Society*

ADMINISTRATIVE ACTIVITIES

- Associate editor *Biostatistics*.
- Honorary Secretary of the *Research Committee* of the *Royal Statistical Society*; member of the Research Workshop Subcommittee.
- Chairing the Statistics and Probability Unit, University of Groningen.

RESEARCH INTERESTS:

Dr Wit's primary research interests lie in the field of Statistical Bioinformatics. His research focusses on

- Modelling local network motif via statistically embedded differential equation models (with A. Recchia, R. Khanin and V. Vinciotti)
- Modelling protein interactions in the MAPK pathway (with Ms V. Purutcuoglu, Prof W. Kolch, Dr M. Girolami and Dr S. Rogers)
- Bayesian modelling of gene networks with topological constraints (with N. Thomson and A. Grassi)
- Inference of transcription factor activity (with Dr. R. Khanin and Dr V. Vinciotti).
- Selecting hyper-parameters in Local Linear Embedding (with Dr E. Grilli)
- L_1 penalized logistic regression (with Dr A. Recchia)
- Practical analysis of microarray data (with Dr J. McClure)
- Statistical design of microarray experiments (with Dr R. Khanin, Dr Y. X. Fang, Mr G. Green and Mr X. Zhu).
- Hidden Markov models for gene expression time series (with Dr N. Friel).
- Weighted inference for microarray experiments (with Dr D. Bakewell).
- Bayesian approaches to controlling the False Discovery Rate (with Dr L. Palla).

GRANTS:

- Principal Investigator, *January 2008 – 31 May 2008*, “Data mining: A Large Scale Re-analysis of Designed Microarray Experiments”, NE/F001355/1, £168,000, Natural Environment Research Council.
- Principal Investigator, *April 2006 – March 2008*, “A lifetime of attrition: post-genomic analyses of ecological and evolutionary processes in nematode-vertebrate systems”, NE/D000602/1, £150,000, Natural Environment Research Council.
- Principal Investigator, *September 2005 – August 2008*, “Stochastic Modelling and Statistical Inference of Gene Regulatory Pathways: Integrating Multiple Sources of Data”, £204,395, Engineering and Physical Sciences Research Council.
- Principal Investigator, *February 2003 – February 2007*, “DNA microarray data analysis and modelling: an integrated approach,” £218,728, Biotechnology and Biological Sciences Research Council and Engineering and Physical Sciences Research Council.
- Principal Investigator (Value In People award holder – 2003-2004), Wellcome Trust, £22,853; not taken up as designated person was unable to take up post.
- Co-applicant, *February 2003 – February 2005*, “Functional genomics of nutrient

transport in Arabidopsis: a bioinformatics approach,” £87,306, Biotechnology and Biological Sciences Research Council, with Dr Anna Amtmann, IBLS, Glasgow.

- Principal Investigator, *November 2001 – January 2004*, “Discovering the frontiers of statistical bioinformatics,” £14,180, Engineering and Physical Sciences Research Council.
- Co-applicant, *September 2002*, “Ph.D. Summer School: Mathematical, Computational and Statistical Modelling of Biological Systems,” £14,000, *Mathfit Programme*, Engineering and Physical Sciences Research Council, with Dr Ela Hunt, Computer Science, Glasgow.

AWARDS AND SCHOLARSHIPS:

- (2004-5) *Teacher Mobility Grant*, University of Glasgow, €600. For guest-teaching visit to University of Bologna.
- (1994-97) *Fulbright Fellowship*, US government.
- (1994-97) Several *smaller grants*: Dittmer Grant (Dittmer Fund), De Bussy Grant (De Bussy Stichting), VU-Fonds Grant (Vrije Universiteit, Amsterdam), VSB Grant (VSB Bank).

PUBLICATIONS

- Sperrin, M., Jaki, T., **Wit, E.**, “Probabilistic relabelling strategies for the label switching problem in Bayesian mixture models”, *Statistics and Computing*, forthcoming.
- Purutcuoglu, **Wit, E.**, “Bayesian inference for the MAPK/ERK pathway by considering the dependency of the kinetic parameters”, *Bayesian Analysis*, Vol.3, No.4, pp.851-86, 2008.
- Recchia, A, **Wit, E.**, Vinciotti, V., et al., “Computational inference of replication and transcription activator regulator activity in herpesvirus from gene expression data”, *IET Systems Biology*, Vol. 2, No. 6, pp.385-396, 2008.
- Evans, H; Mello, LV; Fang, YX, **Wit, E.**, et al., “Microarray analysis of gender- and parasite-specific gene transcription in *Strongyloides ratti*”, *International Journal for Parasitology*, Vol.38, No.11, pp.1329-1341, 2008
- Martin, F. L., German, M. J., **Wit, E.**, Fearn, T., Ragavan, N. and Pollock, H. “Identifying variables responsible for clustering in discriminant analysis of data from IR microspectroscopy of a biological sample,” *Journal of Computational Biology*, Vol.14, No.9, pp.1176-1184, 2007
- Purutcuoglu, V., **Wit, E** (2007) “FGX: A Frequentist Gene Expression Index,” *Biostatistics*, 8(2):433-437.

- Khanin, R, Vinciotti, V, Mersinias, V, Smith, CP, **Wit, E** (2007) “Statistical reconstruction of transcription factor activity using Michaelis-Menten kinetics,” *Biometrics (OnlineEarly Articles)*, doi:10.1111/j.1541-0420.2007.00757.x.
- Khanin, R., **Wit, E.** (2007) “Construction of Malaria Gene Expression Network Using Partial Correlations” in **Methods of Microarray Data Analysis V**, Editors McConnell, P., Lin, S. M., Hurban, P., Springer: New York.
- Khanin, R, Vinciotti, **Wit, E** (2006) “Reconstructing repressor protein levels from expression of gene targets in *E. Coli*,” *PNAS*, 103(49):18592-6.
- V. Purutcuoglu and **E. Wit** (2006) “Exact and Approximate Stochastic Simulations of the MAPK Pathway and Comparisons of Simulations Results.” *Journal of Integrative Bioinformatics*, 3(2):38.
- **Wit, E.**, Purutcuoglu, V., O’Donovan, L., Zhu, X. (2006) “Gaining weights... and feeling good about it” in *Microarray Technology and Cancer Gene Profiling*, Editor S. Mocellin, Springer, New York, 2006.
- Khanin, R and **Wit, E** (2006) “How scale-free are gene networks?”, *J. of Computational Biology*, Vol. 13, 3, pp. 810–8.
- **Wit, E**, Khanin, R (2006) “Integrating statistical approaches in experimental design and data analysis,” In: *Encyclopedia on Genetics, Genomics, Proteomics and Bioinformatics*, Vol.4, *Bioinformatics*. John Wiley & Sons.
- Flück, M, Daepf, C, Schmutz, S, Hoppeler, H, **Wit, E** (2005) “Transcriptional profiling of skeletal muscle plasticity: the underestimated influence of shifts in gene expression and of technical limitations,” *J Appl Physiol*, 99(2): 397 - 413.
- **Wit, E**, Nobile, A, Khanin, R, (2005) “Near-optimal designs for dual-channel microarray studies,” *Applied Statistics*, 54(5):817-30.
- Dennis, JL, Hvidsten, TR, **Wit, E**, Komorowski, J, Bell, AK, Downie, I, Mooney, J, Verbeke, C, Bellamy, C, Keith, WN, Oien, KA (2005) “Markers of Adenocarcinoma characteristic of the site of origin: development of a diagnostic algorithm,” *Clinical Cancer Research*, 11(10):3766-72.
- Khanin, R and **Wit, E** (2005) “Design of large time-course microarray experiments with two channels,” *Applied Bioinformatics* 4(4):253-61.
- Vinciotti, V, Khanin, R, D’Alimonte, D, Liu, X, Cattini, N, Hotchkiss, G, Bucca, G, de Jesus, O, Rasaiyaah, J, Smith, CP, Kellam, P and **Wit, E** “An experimental evaluation of a loop versus a reference designs for two-channel microarrays,” *Bioinformatics*, **21**:492-501.
- Bakewell, D, **Wit, E** (2005) “Weighted analysis of microarray gene expression using maximum likelihood,” *Bioinformatics*, **21**:723-9.
- **Wit, E** and McClure, JD (2004) *Statistics for Microarrays; Design, Analysis and Inference*, Chichester: John Wiley & Sons.
- McClure, JD, **Wit, E** (2003) “Post-normalization quality assessment visualization of microarray data,” *Comparative and Functional Genomics*, November,

2003.

- **Wit, E** (2003) “Who wants to be... The Use of a Personal Response System in Statistics Teaching,” *MSOR Connections*, **3**:2, pp. 14–20.
- **Wit, E**, McClure, JD (2003) “Statistical Adjustment of Signal Censoring in Gene Expression Experiments,” *Bioinformatics*, 19:9.
- Dennis, JL, Vass, JK, **Wit, E**, Keith, WN, Oien, KA (2002) “Identification from public data of molecular markers of adenocarcinoma characteristic of the site of origin,” *Cancer Research*, 62:5999-6005.
- **Wit, E**, McCullagh, P (2001) “The Extendibility of Statistical Models,” in *Algebraic methods in Statistics*, AMS Contemporary Mathematics Series.
- Haas, M, **Wit, E** (2000) “Etiologies and outcome of acute renal insufficiency in older adults,” with M. Haas, *The Am. J. of Kidney Diseases*, **35**, No. 3, pp. 433-47.
- Haas, M, **Wit, E** (1999) “Smooth muscle-specific actin levels in renal transplant recipients,” with M. Haas, *The Am. J. of Kidney Diseases*, **34**, No. 1, pp. 69-84.
- **Wit, E** (1999) “Kant and the limits of civil obedience,” *Kant-Studien*, Band 90, Heft 3, pp. 285-305.

PROCEEDINGS

- Fang, Y.X., **Wit, E.**, “Test the overall significance of p-values by using joint tail probability of ordered p-values as test statistic”, *Advanced Data Mining and Applications, Proceedings 4th International Conference, ADMA 2008*, pp.435-43, 2008.
- **Wit, E**, Thomson, N (2005) “Bayesian modelling of gene networks with topological constraints”, *Proceedings of the International Workshop on Statistical Modelling*, Sydney.
- **Wit, E**, Van der Laan, M (2003) “Error Control in Multiple Testing using a Mixture Model Setting,” *Conference Proceedings Internal Biometrics Society Meeting*, Italian Region, September 9-12, 2003.
- **Wit, E**, Friel, N (2003) “Hidden Markov Modelling of Genomic Interactions,” *Bulletin of the International Statistical Institute*, 54th session, August 2003.
- **Wit, E** (2002) “Statistical modelling of gene expression data,” *2002 ASA Proceedings*, August 2002.

SUBMITTED PAPERS

- Friel, N, **Wit, E** “Markov random field model of gene co-regulation on the M. tuberculosis genome”, under revision.

THESES AND DISSERTATIONS

- Ph.D. thesis (2000), “The Categorical Imperative: Extendibility Considerations for Statistical Models,” advisor Peter McCullagh, University of Chicago, USA.
- Ph.D. Thesis (1997), “The Ethics of Chance,” advisor Joseph Kockelmans, Pennsylvania State University, USA.
- M.A. Thesis (1997), “Risk and Responsibility,” advisor Peter Kirschenman, Vrije Universiteit, Amsterdam, Netherlands.
- M.A. Thesis (1997), “Kantian Philosophy and the Limits of Civil Obedience,” advisor Henk Woldring, Vrije Universiteit, Amsterdam, Netherlands.
- M.Sc. Thesis (1994), “Maximum Likelihood Estimation in Mixture Models,” advisor Aad van der Vaart, Vrije Universiteit, Amsterdam, Netherlands.

TEACHING AND SUPERVISION

Being a scientist is as much as about obtaining scientific results as it is about communicating them. Teaching is one, however integral part of this process. My involvement ranges from giving annual Master’s classes to unprivileged but promising high-school students to supervising post-doctoral assistants.

- March 2004, external examiner, Luigi Palla, PhD defence, Department of Statistics, University of Bologna, Italy.
- October 2005, external examiner, Wiesner Vos, PhD defence, Department of Statistics, University of Oxford.
- March 2006, external examiner, Angela Recchia, PhD defence, Department of Statistics, University of Bari, Italy.
- September 2006, external examiner, Bjarte Dysvik, PhD defence, Department of Informatics, University of Bergen, Norway.
- November 2006, external examiner, Mizan Khondoker, PhD defence, Bioss, University of Edinburgh.
- March 2007, external examiner, Elisa Grilli, PhD Defence, Department of Statistics, University of Bologna, Italy.
- External examiner, M.Sc. Statistics, School of Mathematics, University of Leeds.
- (2006-2008) Post-doc supervision, Yongxiang Fang on NERC grant.
- (2003-2005) Post-doc supervision, Raya Khanin (2003-5), Angela Recchia (2006-2007) on “Exploiting Genomics” grant (EPSRC/BBSRC).
- (2004-2005) Visiting Ph.D. student supervision, Angela Recchia, *L₁ constraint inference*.
- (2005) M.Sc. supervision, Noel Thomson, *Modelling genetic networks with topological constraints*.

- (2004-2009) Ph.D. supervision: Ximin Zhu, *Statistical Design for Microarray Studies*.
- (2004-2007) Ph.D. supervision: Vilda Purutcuoglu, *Bayesian methods for gene network analysis*.
- (2000-current) Post-graduate teaching; *Research communication, Computational methods using R, L^AT_EX for publications, Constructing personal research website*.
- (2003-2005) Guest lecturing, *Biostatistics Master's Programme*, Department of Statistics, "Paolo Fortunati", University of Bologna.
- (2000-current) Undergraduate teaching; *Probability, Survival Analysis, Time-series and spatial processes*.
- (2000-current) Undergraduate honours and M.Sc. projects supervision.
- (2001-2004) Supervision Ph.D., Luigi Palla; thesis on *Bayesian models to test DNA microarray data for differential expression* at the University of Bologna, Italy. (Currently post-doc at Department of Statistics, Vrije Universiteit, Amsterdam)
- (2001-2004) Post-doc supervision, John McClure. (Currently lecturer in statistical genetics, University of Glasgow)
- (1999) Post-graduate teaching; *statistical modelling and category theory*. Department of Statistics, University of Chicago.
- (1998) Undergraduate teaching; *applied statistics*, Department of Statistics, University of New South Wales.
- (1995-1997) Undergraduate teaching; *probability, applied statistics*, Department of Statistics, Pennsylvania State University.

SCIENTIFIC MEETINGS AND CONFERENCES

— invited talks only, excluding departmental seminars

- "Mixed modelling ideas for microarray data", invited talk, CLADAG, Catania, Italy, 9-11 September 2009.
- "How statistics conquered genetics (or vice versa)", invited talk, Nederlands Mathematisch Congres, Groningen, The Netherlands, 14 April 2009.
- "Reverse engineering pathway dynamics from microarray data", invited talk, IBS-EMR Conference, Istanbul, Turkey, 13 May 2009.
- "Muddling or modelling your way through normalization?", CAMDA, Vienna, Austria, 5 December 2008.
- "Nesting and other replication issues in two-channel microarray designs", invited talk, International Biometric Conference, 17 July 2008.
- "High-dimensional inference in bioinformatics and genomics," Newton Institute, *Future Directions in High-dimensional Data Analysis: New Methodologies, New*

Data Types and New Applications, Cambridge, 24 June 2008.

- “From genomes to systems and ‘some’ statistics in-between”, invited talk, From Genomes to Systems Conference, Manchester, UK, 19 March, 2008.
- “Modelling transcription activation using microarray data”, invited talk, 6th workshop: Statistical Methods for Post-genomic Data”, Rennes, France, 31 January 2008.
- “Random effects modelling for multivariate data from cDNA microarrays”, invited talk, CLADAG, Macerata, Italy, 13 September 2007.
- “Statistics for Microarrays,” invited short course, Ankara, 15 August 2007.
- “Microarray study design,” invited talk, *NUGO microarray data analysis course*, Maastricht, Netherlands, 2-5 July 2007.
- “Reverse engineering pathway dynamics from microarray data”, invited talk, *International Workshop Omics: Assembling System(s) Biology*, Lugano, Switzerland, 24-8 June 2007.
- “Microarray experiments: linear mixed-effect models for unusual designs”, invited tutorial, *NERC Microarray and Gene Expression Workshop*, Liverpool, 14-7 May 2007.
- “Modelling transcription activation using microarray data,” invited talk, *Statistical Bioinformatics & Stochastic Systems Biology*, Newcastle, 2-3 April 2007.
- “statistics for microarrays,” invited tutorial, *BioSysBio Conference*, Manchester, 10 January, 2007.
- “Design for microarray experiments,” invited talk, *RSS Conference*, 10-14 September, 2006, Belfast, UK.
- “Optimal design for microarrays,” invited talk, *Design Workshop*, 8-10 September, 2006, Southampton, UK.
- invited talk, *IMS Workshop in Probability*, 30 July-4 Aug, 2006, Rio de Janeiro, Brazil.
- “Statistics for Microarrays: a One Day Tour,” invited Short Course, *International Workshop on Statistical Modelling*, 2 July, 2006, Galway, Ireland.
- “Multivariate Analysis in Bioinformatics,” Master Course, 29 May - 2 June, 2006, Department of Statistics, University of Padova, Italy. “Statistical Analysis of Genetic and Gene Expression Data,” MolPAGE training, March 20-24, 2006, University of Pavia, Italy.
- Invited talk, Workshop on Experimental Design, Friday 10th March 2006, BioScope-IT, Ghent, Belgium.
- “Design of Microarray Experiments,” invited talk, *5th VIB Microarray Users Group Meeting*, ” 16-18 November 2005, Ghent, Belgium.
- “Inferring transcription factor activity from gene expression data,” *Data Fusion Meeting*, 6-8 September 2005, London, UK.

- “Decision making and modelling in genomics,” invited talk, *25th European Meeting of Statisticians*, 24-28 July, 2005.
- “Statistical Bioinformatics,” invited speaker, *European Young Statisticians Training Camp*, 18-23 July, 2005.
- “Hierarchical network modelling with architectural constraints,” invited talk, *Recent Advances in Biostatistics, Bioinformatics and Markov Chain Monte Carlo*, University of New South Wales, Sydney, 6-7 July 2005.
- “Experimental Design and Differentially Expressed Genes,” *ESF Training Course: Microarray Gene Expression Analysis: Power and Potential of Standardisation*, 23-7 May 2005, Trondheim, Norway.
- “From experimental design to biological networks”, *Intelligent Data Analysis*, 18-20 May 2005, Leiden, Netherlands.
- “Classification in high-dimensional spaces with microarrays in mind,” invited talk, *Statistics Day*, 11 April, 2005, University of Rotterdam.
- “Robust optimal designs of microarray experiments using simulated annealing,” invited talk, *DEINDE workshop*, 29-31 March 2005, Turin, Italy.
- “The Role of Statistics in Genomics,” invited talk, *RCUK Genomics Showcase*, 16 November 2004, Brussel, Belgium.
- “Optimal design of microarray experiments,” invited talk, *BBSRC Microarray Workshop, Methods of analysis and interpretation of microarray data*, 20-1 September 2004, Rothamsted Research, Harpenden, U.K.
- “Statistics for Microarrays: Design, Analysis and Inference”: 2-day workshop, Department of Epidemiology and Medical Statistics, University of Verona.
- “How not to analyze microarray data,” invited talk, *Statistical Microarray Workshop*, University of Singapore, Singapore, January 2004.
- “Error control in multiple testing using a mixture model setting,” invited talk, *International Biometrics Society Conference*, Marina di Massa, Italy, 11 Sept 2003.
- “Statistical Microarray Analysis Workshop,” *International Biometrics Society Conference*, Marina di Massa, Italy, 9-10 Sept 2003.
- “Hidden Markov Models for Gene Expression Analysis,” *Joint Statistical Meeting*, San Francisco, USA, 5 Aug 2003.
- “Can We Make Statistics Count in Bioinformatics,” 8 May, 2003, Royal Statistical Society, Local North-East Group, Durham.
- “Hidden Markov Modelling of Genomic Expression Interactions” 22 February 2003, *Statistical Microarray Workshop*, MaPhySto, University of Aarhus, Denmark.
- “Can We Make Statistics Count in Bioinformatics,” 13 February, 2003, Royal Statistical Society, Local Group Aberdeen.

- “Hidden Markov Models for Genomic Interactions,” 15 January 2003, Seminar at Computational Biology Seminars, University of Glasgow.
- “Bayesian Hierarchical Models in Microarray Studies,” invited talk, *BIOSS Annual lecture*, Edinburgh, 18 November, 2002.
- “Hierarchical Models for Gene Expression Analysis,” invited talk, *Workshop on Statistical Aspects of Microarray Data*, Aarhus University, Denmark, February 20-22, 2003.
- “Dynamic Analysis of Time Course Gene Expression,” invited talk, at *Mining Biomedical Data Session of Joint Statistical Meeting*, New York, August 11-15, 2002.
- “Experimental Design of Microarray Studies,” *Biologist Meets Statistician Meeting*, (Stratagene), European Bioinformatics Institute, Hixton, May 2002.
- “Correcting for Truncation effects and the Use of Background Information in Microarrays,” Array Meeting, UMIST, February 14, 2002.
- “The Use of Statistics in Microarray Studies,” at *Microarray Technologies Summit & Exposition*, Princeton Marriott, New Jersey USA, September 24-25, 2001.