

CURRICULUM VITAE

PERSONAL DETAILS

Name: **Dr. Jaap. P. L. Brand**
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Email: JaapBrand@ms.soph.uab.edu
Date of Birth: May 26th, 1965
Nationality: Dutch

EDUCATION

1993 – 1998 Ph.D. in Statistics and Medical Informatics
Dissertation: “Development, Implementation, and Evaluation of Multiple Imputation Strategies for the Statistical Analysis of Incomplete Data Sets”
Erasmus University Rotterdam, The Netherlands

1987 – 1992 Ms.C. in Mathematics with specialization in Statistics.
Free University, Amsterdam, The Netherlands

SKILLS

Languages: Dutch (mother tongue), English (fluent), German (reasonable)
Statistical packages: SAS, BMDP, SPSS, SPLUS
Programming languages: C, C++, FORTRAN, Pascal, S-plus, R

WORK EXPERIENCE

2001 – Present **Department of Biostatistics, UAB**, Ryals Public Health Bldg 327M, 1665 University Blvd, UAB, Birmingham AL 35294 – 0022

Position: **Post-Doctoral Scholar in Biostatistics and Statistical Genetics**

- Developed algorithms for more cost-efficient multiplicity control in finding differentially expressed genes and investigating its generalization to multiplicity control in High Dimensional Biology.
- Assessed various two sample hypothesis tests for finding differentially expressed genes using extensive simulation study. These methods have been implemented in MDAC software.
- Contributed to the internal Microarray Data Analysis Clearinghouse (MDAC) project, the purpose of which is to streamline the department's data analyses carried out for investigators and to develop standard software. The software allows data normalization, transformation, hypothesis testing a variety of tests, multiple comparison adjustments, and estimation the number of differentially expressed genes. My contribution includes:
 - Written overview document about all statistical analyses implemented in the MDAC software to be delivered to investigators.
 - Developed exact bootstrap two sample hypothesis test.
 - Wrote technical specification for this bootstrap method for programmers.
 - Analyzed microarray data for several investigators.

2000 – 2001 **TNO Nutrition and Health** Utrechtseweg 48, 3700 AJ Zeist, The Netherlands

Position: **Statistician**

- Developed statistical methods for probabilistic risk assessment in nutritional epidemiology applied to food allergy and contaminants in the food chain.
- Standardized the application of a semi-parametric transformation method for estimating the usual daily intake distributions to be carried out by data management. This standardization includes:
 - Written a Standard Operation Procedures (SOP) containing instructions for data management to carry out the statistical analyses and to distinguishing between standard problems and problems for which a statistician need to be consulted.
 - Written standard document for the interpretation of results to be reported to the principal investigator.
- Carried out randomization, statistical analyses and power calculations for clinical studies.

- 1998 – 2000 **Statistical Solutions Ltd**, 8 South Bank, Crosse's Green, Cork, Ireland.
Position: **Statistician and Software Test Engineer**
Worked on the company's products: EquivTest, used for equivalence testing, and SOLAS, the first commercially available multiple imputation software.
- EquivTest:**
- Sourced algorithms for the statistics being calculated for the programming group and developed algorithms for those where no existing algorithms were available.
Validated the statistical computations using SAS and co-authored a validation report available on the company web-site:
<http://www.statsol.ie/equivtest/equivtest.htm#validation>
- SOLAS:**
- Wrote detailed specifications for algorithms at the core of the imputation process to be implemented by the programming group and assisted the programmers in the correct implementation of these algorithms.
 - Implemented extensive non-trivial automated validation procedures in SAS. The results of this had been collated into a validation report which is available on the company web-site:
<http://www.statsol.ie/solas/solas.htm#validation>
 - Wrote chapters for the user's manual.

WORK UNDERTAKEN DURING MY Ph.D. RESEARCH (1993 – 1998)

The primary objective of my Ph.D. research is multiple imputation, a technique for statistical analysis of incomplete data sets containing missing values. In multiple imputation, for each missing value a number of m likely values based on a statistical model are filled in resulting in m completed data sets. Each completed data set is analyzed by the desired statistical technique for complete data. The resulting m intermediate results are pooled into one final result using standard rules. My work during my Ph.D research includes the following:

- Developed a flexible variable-by-variable Gibbs sampling algorithm for the generation of imputations. The imputation model is specified by individually specifying for each imputation variable a regression model based on a suitable set of predictor variables for this imputation variable. The imputations are generated via a Markov Chain Monte Carlo algorithm. The basic advantages of the variable-by-variable Gibbs sampling algorithm are that the imputation model can be tailored to any data set and that the algorithm can be applied well to large data sets containing many imputation variables. The same algorithm is implemented in the statistical software MICE available at www.multiple-imputation.com.
- Carried out an extensive simulation study which demonstrated that the variable-by-variable Gibbs sampling algorithm has good statistical properties.
- Implemented an interactive system, called the missing data engine, for the statistical analysis of incomplete data sets using multiple imputation by means of the variable-by-variable Gibbs sampling algorithm described in my thesis. The missing data engine is embedded in a Medical Workstation with indirect client-server architecture called HERMES. Features of this interactive system are:
 - Developed graphical user interface for selecting the imputation model allowing the user to select appropriate predictor variables for each imputation variable.. When incomplete predictor variables are selected, the interface is updated to allow the user to select additional predictor variable for each of these incomplete predictor variables.
 - Developed graphical user interfaces for several modules of the statistical software package BMDP and connectors to connect these interfaces with BMDP.
 - Developed flexible and table-driven software for pooling of the m completed data results for several BMDP modules. Pooling of results can be extended to another BMDP module by specifying a new table.
- Applied this interactive system to a large multivariate study conducted at TNO Prevention and Health in Leiden, The Netherlands. The main purpose of the study was to assess risk factors for several types of accidents incurred by elderly people. For this purpose I have developed an algorithm for pooling step-wise logistic regression results from the completed data sets.

PRESENTATIONS

Brand, J.P.L. 2002. The Funnel Algorithm: Toward an Epistemologically Rigorous and Statistically Powerful Procedure for the analysis of Microarray Data. Seminar in the Section on Statistical Genetics, Department of Biostatistics, University of Alabama at Birmingham, September 27, Birmingham, USA

Brand, J.P.L. 2002. The Funnel algorithm: Toward an epistemologically rigorous and statistically power procedure for the analysis of microarray data. Annual Retreat of the Microarray Research Coordination Network, September 15-19, Mohonk, USA

Brand, J.P.L., Page, G.P., Allison, D.B. 2002. The Funnel algorithm: Toward an Epistemologically Rigorous and Powerful Procedure for the Analysis of Microarray Data. Paper presented at the 2002 Annual Meeting of the Classification Society of North America, June 13-16, Madison, Wisconsin USA.

GRANT WRITING EXPERIENCE

- Preparing own R21 grant for more cost-efficient multiplicity control in High Dimensional Biology by taking full advance of observed and/or assumed structures in the data set to be submitted by October, 1, 2003
- Wrote sections of grants 'Toward Sound Statistical foundations of microarray data Analysis' (funded by NSF 10/02) and the Center for Nutrient Gene Interactions; (funded by NIH/NCI 6/03)

EDITORIAL EXPERIENCE

2002 Journal of Official Statistics: Peer Reviewer
2003 Human Heredity: Peer Reviewer

PUBLICATIONS

Yang D, Zakharkin S.O., Page G.P., Edwards J.W., **Brand J.P.L.**, Bartoculli A.A., Allison D.B. Applications of Bayesian Statistical Methods in Microarray Data Analysis. Invited review *submitted for publication to Pharmacogenomics.*

Brand J.P.L. Gadbury G, Beasley T.M, Page GP, Long, J.D., Edwards, J.W., Allison D.B., A Comparison of Some Non-Parametric Alternatives for Inferential Testing in Microarray Research. *Submitted for publication to Journal of Computational Biology.*

Beasley, T.M., Page, G.P., **Brand, J.P.L.**, Gadbury, G.L., Mountz, J.D., and Allison, D.B., 2003. Chebyshev's Inequality for Non-parametric Testing with Small N and α in microarray research. To appear in Applied Statistics: Journal of the Royal Statistical Society (Series C).

Huang-Ge Zhang, Karren Hyde, Grier P. Page, **Jacob P.L. Brand**, Juling Zhou, David B. Allison, Hui-Chen Hsu, John D. Mountz. TNF – α Induced Nf- kB Regulated Genes in RASF. *Submitted for publication to Arthritis and Rheumatism.*

Brand JPL, Buuren van S., Oudshoorn K. 2003. A toolkit in SAS for the evaluation of multiple imputation methods, Statistica Neerlandica, 57, 1-10

Lee, C.K., Allison, D.B., **Brand, J.P.L.**, Weindruch, R., Prolla, T.A. 2002. Transcriptional profiles associated with aging and middle age-onset caloric restriction in mouse hearts. PNAS, 99, 14988-14993

Van Buuren S, Van Mulligen EM, **Brand J.P.L.** Omgaan met ontbrekende gegevens in statistische data bases: Multiple imputatie in HERMES, Kwantitatieve methoden, 1995, nummer 50: 5-13

Brand J.P.L., Buuren S., Van Mulligen EM., Brand J, Routine multiple imputation in statistical databases. Proceedings of the Eighteenth Annual Symposium on Computer Application in Medical Care, 1994: pp. 303-306

Van Mulligen E.M., Timmers T., **Brand J.P.L.**, Cornet R., Van den Heuvel F., Kalshove K., Van Bommel J.H. 1994. HERMES: health care workstation integration architecture. International Journal of Bio-Medical Computing, 24, 267 – 275