

Curriculum Vitae of Dr. Hirokazu Yanagihara

Name: Hirokazu Yanagihara
Date of Birth and Place: August 8, 1972, Fukuoka, Japan
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Sex: Male
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Academic Status: Associate Professor

Education:

Bachelor of Art Degree, Faculty of School Education, Hiroshima University, 1996.
Master of Science, Graduate School of Science, Hiroshima University, 1998.
Doctor of Science, Graduate School of Science, Hiroshima University, 2001.

Ph. D / Master / Bachelor:

Doctor of Science, Hiroshima University, 2001.

Title of Ph.D Thesis: Asymptotic expansions of the null distributions of three test statistics in a nonnormal GMANOVA model

Employment:

April/2001-March/2003: Assistant Professor, Department of Statistical Methodology, Division of Multidimensional Analysis, The Institute of Statistical Mathematics
February/2003-March/2003: Visiting Assistant Professor, Laboratory for Social Research, University of Notre Dame, Notre Dame, Indiana, USA
April/2003-March/2004: Assistant Professor, Institute of Policy and Planning Sciences, University of Tsukuba
March/2004-May/2004: Visiting Assistant Professor, Laboratory for Social Research, University of Notre Dame, Notre Dame, Indiana, USA
April/2004-June/2006: Assistant Professor, Department of Social System and Management, Graduate School of Systems and Information Engineering, University of Tsukuba
July/2006-present: Associate Professor, Department of Mathematics, Graduate School of Science, Hiroshima University
May/2007-present: Statistical Adviser, Division of Real-Estate Research, TOKYO KANTEI, Co. Ltd.
March/2010-October/2010: Guest Researcher, Department of Statistics, University of Toronto

Teaching Experience:

1. April/2002-March/2003. Lecturer (part-time) about Elementally Statistics, Department of Econometrics, Chiba University, Chiba.
2. April/2003-June/2003, May/2004-June/2004, April/2005-June/2005, April/2006-June/2006. Lecturer about Statistics, Master's Program in Management and Public Policy, University of Tsukuba, Ibaraki.
3. November/2003. Lecturer about Elementally Differential and Integral Calculus, College of Policy and Planning Sciences, University of Tsukuba, Ibaraki.
4. December/2003- February/2004. Lecturer about Information Processing Training, College of Policy and Planning Sciences, University of Tsukuba, Ibaraki.
5. December/2004-February/2005, April/2005-June/2005, April/2006-June/2006. Lecturer about Elementally Linear Algebra, College of Policy and Planning Sciences, University of Tsukuba, Ibaraki.
6. December/2004-February/2005, December/2005-February/2006. Lecturer about Training for JAVA Programming, College of Policy and Planning Sciences, University of Tsukuba, Ibaraki.
7. December/2004- February/2005. Lecturer about Information Processing Training, College of Policy and Planning Sciences, University of Tsukuba, Ibaraki.
8. December/2005-February/2006. Lecturer about Elementally Statistics, College of Policy and Planning Sciences, University of Tsukuba, Ibaraki.
9. October/2006-February/2007, October/2007-February/2008, April/2008-July/2008, October/2009-February/2010, October/2010-February/2011, April/2011-July/2011, October/2012-February/2013, April/2013-July/2013, April/2014-July/2014. Lecturer about Mathematical Statistics, Department of Mathematics, Hiroshima University, Hiroshima.
10. October/2006-February/2007. Lecturer about Mathematical Statistics “Estimation and Hypothesis Testing”, Master’s Program in Department of Mathematics, Hiroshima University, Hiroshima.
11. April/2007-February/2008. Lecturer about Linear Algebra, Department of Mathematics, Hiroshima University, Hiroshima.
12. April/2007-July/2007, April/2009-July/2009. Lecturer about Mathematical Statistics “Distribution Theory”, Master’s Program in Department of Mathematics, Hiroshima University, Hiroshima.
13. October/2008-February/2009, October/2011-February/2012. Lecturer about Mathematical Statistics “Information Criterion for Model Selection”, Master’s Program in Department of Mathematics, Hiroshima University, Hiroshima.
14. October/2008-February/2009, October/2010-February/2011, October/2012-February/2013. Lecturer about Data Science using R, Department of Mathematics, Hiroshima University, Hiroshima.
15. October/2010-February/2011. Lecturer about Mathematical Statistics “Multivariate Analysis”, Master’s Program in Department of Mathematics, Hiroshima University, Hiroshima.
16. April/2012-July/2012. Lecturer about Elementally Mathematical Statistics, Department of Education, Hiroshima University, Hiroshima.
17. September/2013. Lecturer about Mathematical Statistics “Information Criterion for Model Selection”, Master’s Program in Department of Mathematical Sciences, Graduate School of Engineering, Osaka Prefecture University, Osaka.
18. October/2013-February/2014. Lecturer about Mathematical Statistics “Model Selection Criterion for Nonparametric Regression”, Master’s Program in Department of Mathematics, Hiroshima University,

Hiroshima.

Field of Research:

1. Sample distribution theory under nonnormality.
2. Properties of information criteria for model selection.
3. Parametric and non-parametric regression analysis.
4. Analysis for condominium price in Japan

Membership of Academic Societies:

1. Japan Statistical Society: 1997-present (2006: Young committee of Commemoration of the 75th Anniversary of the Japan Statistical Society, 2013-2015: Editorial board of Journal of the Japan Statistical Society, 2013: Governing board of the 2013 Japanese Joint Statistical Meeting)
2. The Biometric Society of Japan: 2001-present
3. The International Biometric Society: 2003-present
4. The Behaviormetric Society of Japan: 2004-present
5. Psychometric Society: 2004-present (2007: Local organizing committee of International Meeting of the Psychometric Society 2007)
6. Japanese Society of Applied Statistics: 2006-present (2006-2009: Editorial board of Japanese Journal of Applied Statistics)
7. Mathematical Society of Japan: 2006-present (2009-2012: Governing board of Statistics and Probability Section)
8. Statistical Society of Canada: 2010-present

List of Publications:

(I) Journal Articles (Referred):

- [1] Fujikoshi, Y., Ohmae, M., & Yanagihara, H. Asymptotic approximations of the null distribution of the one-way ANOVA test statistic under nonnormality. *Journal of the Japan Statistical Society*, **29** (2), 147–161, 1999.
- [2] Yanagihara, H. Asymptotic expansion of the null distribution of one-way ANOVA test statistic for heteroscedastic case under nonnormality. *Communications in Statistics Theory and Methods*, **29** (2), 463–476, 2000.
- [3] Yanagihara, H. Asymptotic expansions of the null distributions of three test statistics in a nonnormal GMANOVA model. *Hiroshima Mathematical Journal*, **31** (2), 213–262, 2001.
- [4] Wakaki, H., Yanagihara, H., & Fujikoshi, Y. Asymptotic expansion of the null distribution of test statistic for multivariate linear hypothesis under nonnormality. *Hiroshima Mathematical Journal*, **32** (1), 17–50, 2002.
- [5] Yanagihara, H. Asymptotic expansion of the null distribution of test statistic for linear hypothesis in nonnormal linear model. *Journal of Multivariate Analysis*, **84** (2), 222–246, 2003.
- [6] Yanagihara, H., & Tonda, T. Adjustment on an asymptotic expansion of the distribution function with χ^2 -approximation. *Hiroshima Mathematical Journal*, **33** (1), 15–25, 2003.
- [7] Satoh, K., Yanagihara, H., & Ohtaki, M. Bridging the gap between *B*-spline and polynomial regression model. *Communications in Statistics Simulation and Computation*, **32** (1), 179–190, 2003.

- [8] Yanagihara, H., Sekiguchi, R., & Fujikoshi, Y. Bias correction of AIC in logistic regression models. *Journal of Statistical Planning and Inference*, **115** (2), 349–360, 2003.
- [9] Yanagihara, H., & Yoshimoto, A. Applicability of a GMANOVA model to tree diameter growth analysis. *Proceedings of the Institute of Statistical Mathematics*, **52** (1), 19–35, 2003 (in Japanese).
- [10] Yanagihara, H., & Ohtaki, M. Knot-placement to avoid over fitting in B -spline scedastic smoothing. *Communications in Statistics Simulation and Computation*, **32** (3), 771–785, 2003.
- [11] Fujikoshi, Y., Noguchi, T., Ohtaki, M., & Yanagihara, H. Corrected versions of cross-validation criteria for selecting multivariate regression and growth curve models. *Annals of the Institute of Statistical Mathematics*, **55** (3), 537–553, 2003.
- [12] Nishiyama, H., Yanagihara, H., & Yoshimura, I. SAS/IML program for computing probabilities related to Maximum Contrast Methods. *Japanese Journal of Biometrics*, **24** (2), 57–70, 2003 (in Japanese).
- [13] Yanagihara, H., Matsumoto, C., & Tonda, T. Asymptotic expansion of the null distribution of the modified normal likelihood ratio criterion for testing $\Sigma=\Sigma_0$ under nonnormality. *Hiroshima Mathematical Journal*, **34** (1), 81–100, 2004.
- [14] Yanagihara, H., & Ohtaki, M. On avoidance of the over-fitting in the B -spline non-parametric regression model. *Japanese Journal of Applied Statistics*, **33** (1), 51–69, 2004 (in Japanese).
- [15] Satoh, K., Yanagihara, H., & Ohtaki, M. Clustering method by connected neighborhoods and its application. *Advances and Applications in Statistics*, **4** (2), 223–231, 2004.
- [16] Yanagihara, H. Selection of covariance structure models in nonnormal data by using information criterion: an application to data from the survey of the Japanese national character. *Proceedings of the Institute of Statistical Mathematics*, **53** (1), 133–157, 2005 (in Japanese).
- [17] Yanagihara, H., & Ohmoto, C. On distribution of AIC in linear regression models. *Journal of Statistical Planning and Inference*, **133** (2), 417–433, 2005.
- [18] Nomoto, M., Yoshimoto, A. & Yanagihara, H. A carbon balance analysis on timber production: A case study at Yame area in Fukuoka prefecture. *Journal of Japanese Forest Research*, **87** (4), 313–322, 2005 (in Japanese).
- [19] Yanagihara, H., Tonda, T., & Matsumoto, C. The effects of nonnormality on asymptotic distributions of some likelihood ratio criteria for testing covariance structures under normal assumption. *Journal of Multivariate Analysis*, **96** (2), 237–264, 2005. Erratum, **99** (2), 309–310, 2008.
- [20] Yanagihara, H., & Yuan, K.-H. Four improved statistics for contrasting means by correcting skewness and kurtosis. *British Journal of Mathematical and Statistical Psychology*, **58** (2), 209–237, 2005.
- [21] Yanagihara, H., & Yuan, K.-H. Three approximate solutions to the multivariate Behrens-Fisher problem. *Communications in Statistics Simulation and Computation*, **34** (4), 975–988, 2005.
- [22] Yanagihara, H., & Ohtaki, M. A family of regression models having a partially additive and multiplicative structure on their covariates. *Bulletin of Informatics and Cybernetics*, “Special Issue in Honor of Professor Takashi Yanagawa Part IP”, **37**, 49–64, 2005.
- [23] Yoshimoto, A., Yanagihara, H., & Ninomiya, Y. Finding factors affecting a forest stand growth through multivariate linear modeling. *Journal of Japanese Forest Society*, **87** (6), 504–512, 2005 (in Japanese).
- [24] Fujikoshi, Y., Yanagihara, H., & Wakaki, H. Bias corrections of some criteria for selecting multivariate linear models in a general nonnormal case. *American Journal of Mathematical and Management Sciences*, “25th Anniversary of the Thomas L. Saaty and Jacob Wolfowitz Prizes: New Advances and

Applications by Prize Winners II", **25** (3-4), 221–258, 2005.

- [25] Yanagihara, H. Corrected version of *AIC* for selecting multivariate normal linear regression models in a general nonnormal case. *Journal of Multivariate Analysis*, **97** (5), 1070–1089, 2006.
- [26] Yanagihara, H., Tonda, T., & Matsumoto, C. Bias correction of cross-validation criterion based on Kullback-Leibler information under a general condition. *Journal of Multivariate Analysis*, “Special issue dedicated to Professor Yasunori Fujikoshi”, **97** (9), 1965–1975, 2006.
- [27] Yanagihara, H. A family of estimator for multivariate kurtosis in a nonnormal linear regression model. *Journal of Multivariate Analysis*, **98** (1), 1–19, 2007.
- [28] Kamo, K., Kaneko, S., Satoh, K., Yanagihara, H., Mizuno, S., & Sobue, T. A mathematical estimation of true cancer incidence using data from population-based cancer registries. *Japanese Journal of Clinical Oncology*, **37** (2), 150–155, 2007.
- [29] Yanagihara, H. Conditions for robustness to nonnormality on test statistics in a GMANOVA model. *Journal of the Japan Statistical Society*, **37** (1), 135–155, 2007.
- [30] Yuan, K.-H., Hayashi, K., & Yanagihara, H. A class of population covariance matrices in the bootstrap approach to covariance structure analysis. *Multivariate Behavioral Research*, **42** (2), 261–281, 2007.
- [31] Yamamura, M., & Yanagihara, H. A multivariate probit analysis with the comprehensive survey of living condition of the people on health and welfare: home long-term care utilization under the national long-term care insurance system. *Proceedings of the Institute of Statistical Mathematics*, **55** (1), 125–142, 2007 (in Japanese).
- [32] Kamo, K., Yanagihara, H., Kato, A., & Yoshimoto, A. Probability estimation of snow damage on sugi (*Cryptomeria japonica*) forest stands by logistic regression model in Toyama prefecture, Japan. *Journal of Forest Science*, **24** (3), 2008, 137–142, 2008.
- [33] Yoshimoto, A., Kato, A., & Yanagihara, H. Economic analysis of snow damage on sugi (*Cryptomeria japonica*) forest stands in Japan within the forest stand optimization framework. *Journal of Forest Science*, **24** (3) 143–149, 2008.
- [34] Satoh, K., Yanagihara, H., & Kamo, K. Statistical inference on a linear varying coefficient on longitudinal data of discrete distribution. *Japanese Journal of Applied Statistics*, **38** (1), 19–28, 2009 (in Japanese).
- [35] Yanagihara, H., Nagai, I., & Satoh, K. A bias-corrected C_p criterion for optimizing ridge parameters in multivariate generalized ridge regression, *Japanese Journal of Applied Statistics*, **38** (3), 151–172, 2009 (in Japanese).
- [36] Yamamura, M., & Yanagihara, H. Ordering municipalities by medical cost efficiency under the Japanese national health insurance system using the stochastic cost frontier model. *American Journal of Mathematical and Management Sciences*, **29** (3-4), 371–392, 2009.
- [37] Yanagihara, H., & Satoh, K. An unbiased C_p criterion for multivariate ridge regression. *Journal of Multivariate Analysis*, **101** (5), 1226–1238, 2010.
- [38] Srivastava, M. S., & Yanagihara, H. Testing the equality of several covariance matrices with fewer observations than the dimension. *Journal of Multivariate Analysis*, **101** (6), 1319–1329, 2010.
- [39] Yamamura, M., Yanagihara, H., & Srivastava, M. S. Variable selection in multivariate linear regression models with fewer observations than the dimension. *Japanese Journal of Applied Statistics*, **39** (1), 1–19, 2010.
- [40] Satoh, K., Yanagihara, H., & Kamo, K. A robust estimation method for a growth curve model with

- balanced design. *Journal of Statistics: Advances in Theory and Applications*, **3** (2), 113–124, 2010.
- [41] Yoshimoto, A., Konoshima, M., & Yanagihara, H. Optimal aggregation of adjacent forest stands through the traditional spatially constrained harvest scheduling approach. *Proceedings of the Institute of Statistical Mathematics*, **58** (1), 113–126, 2010 (in Japanese).
- [42] Yanagihara, H., Himeno, T., & Yuan, K.-H. GLS discrepancy based information criteria for selecting covariance structure models. *Behaviormetrika*, **37** (2), 71–86, 2010.
- [43] Tonda, T., Satoh, K., & Yanagihara, H. Statistical inference on a varying coefficient surface using interaction model. *Japanese Journal of Applied Statistics*, **39** (2-3), 59–70, 2010 (in Japanese).
- [44] Satoh, K., & Yanagihara, H. Estimation of varying coefficients for a growth curve model. *American Journal of Mathematical and Management Sciences*, **30** (3-4), 243–256, 2010.
- [45] Matsumoto, C., Yanagihara, H., & Wakaki, H. Improvement of the quality of the chi-square approximation for the ADF test on a covariance matrix with a linear structure. *Journal of Statistical Planning and Inference*, **141** (4), 1535–1542, 2011.
- [46] Yanagihara, H., Kamo, K., & Tonda, T. Second-order bias-corrected AIC in multivariate normal linear models under nonnormality. *The Canadian Journal of Statistics*, **39** (1), 126–146, 2011.
- [47] Yanagihara, H. A non-iterative optimization method for smoothness in penalized spline regression. *Statistics and Computing*, **22** (2), 527–544, 2012.
- [48] Yanagihara, H., & Fujisawa, H. Iterative bias correction of the cross-validation criterion. *Scandinavian Journal of Statistics*, **39** (1), 116–130, 2012.
- [49] Yanagihara, H., Kamo, K., Imori, S., & Satoh, K. Bias-corrected AIC for selecting variables in multinomial logistic regression models. *Linear Algebra and its Applications*, **436** (11), 4329–4341, 2012.
- [50] Nagai, I., Yanagihara, H., & Satoh, K. Optimization of ridge parameters in multivariate generalized ridge regression by plug-in methods. *Hiroshima Mathematical Journal*, **42** (3), 301–324, 2012.
- [51] Kamo, K., Yanagihara, H., & Satoh, K. Bias-corrected AIC for selecting variables in Poisson regression models. *Communication in Statistics Theory and Method*, **42** (11), 1911–1921, 2013.
- [52] Yanagihara, H., Yuan, K.-H., Fujisawa, H., & Hayashi, K. A class of cross-validators model selection criteria. *Hiroshima Mathematical Journal*, **43** (2), 149–177, 2013.
- [53] Nagai, I., Fukui, K., & Yanagihara, H. Choosing the number of repetitions in the iterative plug-in optimization method for the ridge parameters in multivariate generalized ridge regression. *Bulletin of Informatics and Cybernetics*, **45**, 25–35, 2013.
- [54] Fujikoshi, Y., Sakurai, T., & Yanagihara, H. Consistency of high-dimensional AIC-type and C_p -type criteria in multivariate linear regression. *Journal of Multivariate Analysis*, **123**, 184–200, 2014.
- [55] Imori, S., Yanagihara, H., & Wakaki, H. Simple formula for calculating bias-corrected AIC in generalized linear models. *Scandinavian Journal of Statistics*, **41** (2), 535–555, 2014.
- [56] Hashiyama, Y., Yanagihara, H., & Fujikoshi, Y. Jackknife bias correction of the AIC for selecting variables in canonical correlation analysis under model misspecification. *Linear Algebra and its Applications*, **455**, 82–106, 2014.
- [57] Srivastava, M. S., Yanagihara, H., & Kubokawa, T. Tests for covariance matrices in high dimension with less sample size. *Journal of Multivariate Analysis*, **130**, 289–309, 2014.
- [58] Kamada, A., Yanagihara, H., Wakaki, H., & Fukui, K. Selecting a shrinkage parameter in structural equation modeling with a near singular covariance matrix by the GIC minimization method. *Hiroshima*

- [59] Yuan, K.-H., Tian, Y., & Yanagihara, H. Empirical correction to the likelihood ratio statistic for structural equation modeling with many variables. *Psychometrika* (in press).

(II) Proceeding Paper (Referred):

- [1] Yanagihara, H., Yoshimoto, A., & Nomoto, M. A generalized non-linear mixed-effects model for forest growth analysis. *Forest Resources Management & Mathematical Modeling* Vol. **3**, –*FORMATH TSUKUBA*– (Eds. H. Kanomata & A. Yoshimoto), 14–46, 2004, Japan Society of Forest Planning Press, Tokyo (in Japanese).
- [2] Yanagihara, H., & Yoshimoto, A. Clustering individual growth patterns in an even-aged forest stand. *Forest Resources Management & Mathematical Modeling* Vol. **4**, –*FORMATH NAGOYA*– (Eds. H. Kondo, A. Yoshimoto & N. Matsumura), 49–70, 2005, Japan Society of Forest Planning Press, Tokyo (in Japanese).
- [3] Yoshimoto, A., Yanagihara, H., & Nomoto, M. Carbon sequestration and optimal thinning regimes from forest stand optimization modeling. *Forest Resources Management & Mathematical Modeling* Vol. **4**, –*FORMATH NAGOYA*– (Eds. H. Kondo, A. Yoshimoto & N. Matsumura), 71–92, 2005, Japan Society of Forest Planning Press, Tokyo (in Japanese).
- [4] Yanagihara, H., Yoshimoto, A., & Ninomiya, Y. Prediction of carbon sequestered in an even-aged sugi forest stand through growth pattern classification. *Forest Resources Management & Mathematical Modeling* Vol. **5**, –*FORMATH KYOTO*– (Eds. A. Yoshimoto, H. Kondo & T. Hiroshima), 63–83, 2006, Japan Society of Forest Planning Press, Tokyo (in Japanese).
- [5] Ninomiya, Y., Yanagihara, H., & Yoshimoto, A. Forest stand growth analysis based on irregular statistical models. *Forest Resources Management & Mathematical Modeling* Vol. **6**, –*FORMATH KYUSHUO*– (Eds. A. Yoshimoto, T. Hiroshima & H. Kondo), 43–56, 2007, Japan Society of Forest Planning Press, Tokyo (in Japanese).
- [6] Yanagihara, H., Ninomiya, Y., & Yoshimoto, A. Analysis of grouped growth patterns in even-aged sugi forest stand within the framework of mixture model. *Forest Resources Management & Mathematical Modeling* Vol. **7**, –*FORMATH KOBE*– (Eds. N Sasaki & A. Yoshimoto), 39–60, 2008, Japan Society of Forest Planning Press, Tokyo.
- [7] Kamo, K., Yanagihara, H., Kato, A., & Yoshimoto, A. Logistic regression model and model selection for estimating the risk of natural disaster. *Forest Resources Management & Mathematical Modeling* Vol. **8**, –*FORMATH TOHOKU*– (Ed. FORMATH Research Group), 137–152, 2008, Japan Society of Forest Planning Press, Tokyo (in Japanese).
- [8] Yamamura, M., Yanagihara, H., & Srivastava, Muni S. Variable selection by C_p statistic in multiple responses regression with fewer sample size than the dimension. *Knowledge-Based Intelligent Information and Engineering Systems: Lecture Notes in Computer Science, 14th International Conference, KES 2010, Cardiff, Wales, UK, September 8-10, Proceedings, Part III* (eds. R. Setchi *et al.*), 7–14, 2010, Springer, Heidelberg.
- [9] Fukui, K., & Yanagihara, H. Selection of high-dimensional multivariate linear regression models by cross-validation. *Proceedings of the 6th International Conference of IMBIC on Mathematical Sciences for Advancement of Science and Technology MSAST 2012* (eds. A. Adhikari & M. R. Adhikari), 108–117, 2012, IMBIC, Kolkata.

- [10] Imori, S., & Yanagihara, H. General expression of bias of AIC. *Proceedings of the 6th International Conference of IMBIC on Mathematical Sciences for Advancement of Science and Technology MSAST 2012* (eds. A. Adhikari & M. R. Adhikari), 118–129, 2012, IMBIC, Kolkata.

(III) Books:

- [1] Yanagihara, H., & Yoshimoto, A. Statistical procedure for assessing the amount of carbon sequestered by sugi (*Cryptomeria japonica*) plantation. In *Multipurpose Inventory for the Aged Artificial Forest* (Eds. Y. Nobori, N. Takahashi & A. Yoshimoto), 125–140, 2006, Japan Society of Forest Planning, Utsunomiya.
- [2] Yanagihara, H. Selection of variables in multivariate normal linear models. In *Encyclopedia of Statistics and Data Sciences* (Eds. T. Sugiyama, Y. Fujikoshi, N. Sugiura & N. Kunitomo), 192–194, 2007, Asakura Publishing Co., Ltd., Tokyo (in Japanese).
- [3] Yanagihara, H. Selection of variables under nonnormality. In *Encyclopedia of Statistics and Data Sciences* (Eds. T. Sugiyama, Y. Fujikoshi, N. Sugiura & N. Kunitomo), 194–195, 2007, Asakura Publishing Co., Ltd., Tokyo (in Japanese).
- [4] Yanagihara, H. Selection of variables by other criteria. In *Encyclopedia of Statistics and Data Sciences* (Eds. T. Sugiyama, Y. Fujikoshi, N. Sugiura & N. Kunitomo), 196–197, 2007, Asakura Publishing Co., Ltd., Tokyo (in Japanese).
- [5] Yanagihara, H. Selection of variables for reducing dimension. In *Encyclopedia of Statistics and Data Sciences* (Eds. T. Sugiyama, Y. Fujikoshi, N. Sugiura & N. Kunitomo), 198–199, 2007, Asakura Publishing Co., Ltd., Tokyo (in Japanese).
- [6] Fujikoshi, Y., Wakaki, H., & Yanagihara, H. *Basic Mathematics for Probability and Statistics*, 2011, Hiroshima University Press, Inc., Hiroshima (in Japanese).
- [7] Yoshimoto, A., Kamo, K., & Yanagihara, H. *Statistical Analysis for Environmental Data by Using R – Application to Field of Forest Science –* (Series of Practice in Statistical Science), 2012, Asakura Publishing Co., Ltd., Tokyo (in Japanese).

(IV) Proceeding Papers (Non-Refereed):

- [1] Takahashi, A., Yanagihara, H., Ohtaki, M., & Munaka, M. Nonparametric regression analysis of the relationship between price of detached houses and their environmental conditions. *Proceedings of Journal of the Faculty for Human Development Hiroshima Jogakuin University*, **7**, 57–65, 2000 (in Japanese).
- [2] Yanagihara, H., & Yuan, K.-H. Edgeworth expansions of functions of the sample covariance matrix with an unknown population. TR No. 08-05, *Statistical Research Group*, Hiroshima University, 2008.
- [3] Ninomiya, Y., Yanagihara, H., & Yuan, K.-H. Selecting the number of factors in exploratory factor analysis via locally conic parameterization. Research Memorandum No. 1078, *The Institute of Statistical Mathematics*, 2008.
- [4] Yanagihara, H., Wakaki, H., & Fujikoshi, Y. A consistency property of the AIC for multivariate linear models when the dimension and the sample size are large. TR No. 12-08, *Statistical Research Group*, Hiroshima University, 2012.
- [5] Yanagihara, H. Explicit solution to the minimization problem of generalized cross-validation criterion for selecting ridge parameters in generalized ridge regression. TR No. 13-07, *Statistical Research*

Group, Hiroshima University, 2013.

- [6] Yanagihara, H., Kamo, K., Imori, S. & Yamamura, M. A study on the bias-correction effect of the AIC for selecting variables in normal multivariate linear regression models under model misspecification. TR No. 13-08, *Statistical Research Group, Hiroshima University*, 2013.
- [7] Yanagihara, H. Conditions for consistency of a log-likelihood-based information criterion in normal multivariate linear regression models under the violation of normality assumption.
- [8] Yamamura, M., Fukui, K. & Yanagihara, H. Illustration of the varying coefficient model for analyses the tree growth from the age and space perspectives. TR No. 14-06, *Statistical Research Group, Hiroshima University*, 2014.
- [9] Fukui, K., Yamamura, M. & Yanagihara, H. Comparison with RSS-based model selection criteria for selecting growth functions. TR No. 14-07, *Statistical Research Group, Hiroshima University*, 2014.

(V) List of Other Papers:

- [1] Isoyama, M., Hanabusa, N., & Yanagihara, H. The current conditions of language study abroad in Japan. (in Japanese).

Prizes:

- [1] 2006 Jacob Wolfowitz Prize (July 2006): Bias corrections of some criteria for selecting multivariate linear models in a general nonnormal case (with Prof. Y. Fujikoshi & Prof. H. Wakaki).
- [2] 2010 Excellent Paper of Japanese Society of Applied Statistics (May 2010): Statistical inference on a linear varying coefficient on longitudinal data of discrete distribution (with Dr. K. Satoh & Dr. K. Kamo).

Grants:

- [1] Grant-in-Aid for Young Scientists (B), #15700242, 2003-2004, Development of skew distribution with heavy tail.
- [2] Grant-in-Aid for Young Scientists (B), #17700274, 2005-2006, Covariance structure selection by using information criteria and its effect of nonnormality.
- [3] Grant-in-Aid for Young Scientists (B), #19700265, 2007-2009, Asymptotic properties of information criteria for selecting hyper parameter.
- [4] Grant-in-Aid for Challenging Exploratory Research, #22650058, 2010-2012, Development of a non-iterative optimization method for smoothness in penalized spline regression and its application.
- [5] Grant-in-Aid for Challenging Exploratory Research, #25540012, 2013-2015, Theoretical studies of a model selection method by minimizing information criterion.

Patent:

- [1] Itoh, Y., Ishikawa, M., Yoshinari, Y., Shoji, I., & Yanagihara, H. Program, method and device for calculating the appraisal value of the real estate. Plant number: 4810627 (Application number: 2011-080809), Registration date: August 26, 2011 (Application date: March 31, 2011) (in Japanese).

Conferences:

- [1] Yanagihara, H., Ohmae, M., & Fujikoshi, Y. Asymptotic expansion and bootstrap approximation of the

- null distribution one-way ANOVA test statistic under nonnormality. *The 66th Annual Meeting of the Japan Statistical Society*. Tokyo, JAPAN (Chuo University). 28–30. July 1998 (in Japanese).
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