

Division of Information and Systems

Intelligent Data Analytics Laboratory



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Refereed academic journal

[o-fu-309-038-01:2017] Yu Nagai KenIchiro Nishio, Toshihiro Mukai and Kenta Ofuji. Interpretive Issues on Decoupling between Economic Growth and Environmental Burden. *Denryoku Keizai Kenkyu (Power and Economics Studies)*, 65(1):45–54, 4 2018.

There is growing interest in the concept of ‘decoupling’ where environmental burdens are separated from economic growth. Decoupling is a fair aim, but it is beneficial to deepen the understanding of incentives that bring about its realization and to consider measures to be taken in the future. Therefore, in this paper, we discussed the issues surrounding the interpretation of decoupling. In recent years, there are an increasing number of indications of signs of decoupling in other countries, but as a result of reviewing the past literature, starting with the definition of indicators, points of caution in analyzing methods, understanding the results, and further policy considerations are the issues. Since the signs of decoupling first depend on the unique circumstances of the country or region, it also relates to how to handle the data, and macro level analysis that rationalizes its interpretation. Inevitable side effects have also to be considered. In order to properly interpret the decoupling, in addition to the macro level observation, it is necessary to focus on a case analysis, or a targeted analysis of the actual situation.

[o-fu-309-038-02:2017] Kenta Ofuji and Naomi Ogasawara. Verbal disaster warnings and perceived intelligibility, reliability, and urgency: the effects of voice gender, fundamental frequency, and speaking rate. *Acoustical Science and Technology*, 39(2):56–65, TBD 2018.

In this paper, we study the effects of acoustic characteristics of spoken disaster warnings in Japanese on listeners’ perceived intelligibility, reliability, and urgency. Our findings are threefold: (a) For both speaking speed and fo, setting them to normal (compared from slow/fast (+/-20 percent) for speed, and from low/high (+/- up to 36 Hz) for fo) improved the average evaluations for Intelligibility and Reliability. (b) For Urgency only, setting speed to faster (both slow to normal and normal to fast) or setting fo to higher (both low to normal and normal to high) resulted in an improved average evaluation. (c) For all of intelligibility, reliability, and urgency, the main effect of speaking speed was the most dominant. In particular, urgency can be influenced by the speed factor alone by up to 39 percent. By setting speed to fast (+20 percent), all other things being equal, the average perceived urgency raised to 4.0 on the

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1.5 scale from 3.2 when the speed is normal. Based on these results, we argue that the speech rate may effectively be varied depending on the purpose of an evacuation call, whether it prioritizes urgency, or intelligibility and reliability. Care should be taken to the possibility that the respondent-specific variation and experimental conditions may interplay these results.

[paikic-309-038-01:2017] Wuhui Chen, Incheon Paik, and Neil Y. Yen. Discovering internal social relationship for influence-aware service recommendation. *Multimedia Tools and Applications, Springer*, 76(18):18193–18220, September 2017.

Existing approaches, such as semantic content-based or Collaborative Filtering-based recommendations, fail to exploit social aspects of services because services lack social relationships and do not consider social influence. In this paper, we propose a methodology for connecting distributed services in a global social service network (GSSN) to facilitate discovering internal social relationship for social influence-aware service recommendation. First, we propose a novel platform for constructing a GSSN by linking distributed services with social links based on quality of social link. We then propose a flexible model of the effective awareness of social influence, which provides a quantitative measure of the strength of influence between services. Next, a novel social influence-aware service recommendation approach is proposed based on GSSN using internal social relationship among services. The experimental results demonstrated that our new approach can solve the service recommendation problem with a low usage threshold and high accuracy, where the user preferences are exploited by a recommend-as-you-go method.

Refereed proceedings of an academic conference

[paikic-309-038-02:2017] Incheon Paik, Younghyon Heo, and Jeremy Perkins. Classification of Machine-Translated Text Using Deep Learning. In ICEIC Committee, editor, *Proceedings of International Conference on Electronics, Information, and Communication*, Honolulu, Hawaii, January 2018.

In this paper, we investigate automatic detection of machine-translated text using multi-layered perceptron network (MPN). There have been researches on the classification of machine-translated text using shallow learning such as SVM, NB, KNN, etc. For the approaches, it needs to extract higher quality of

features for the documents. The approaches showed good performance for the statistical machine translation. Google started to provide a translation service using neural machine translation approach that is difficult to classify using the existing approaches. We tried deep learning approach, which consists of more than 4 hidden layers of perceptron network. The architecture learns order of words in a sentence internally. We could get very high classification accuracy (99.8%) with large training data set.

[paikic-309-038-03:2017] Chungho Lee and Incheon Paik. Stock Market Analysis from Twitter and News Based on Streaming Big Data Infrastructure. In IEEE, editor, *Proceedings of IEEE International Conference on Awareness Science and Technology (iCAST 2017)*, Taichung, Taiwan, November 2017. IEIE, IEEE.

[paikic-309-038-04:2017] Sheng Zhang and Incheon Paik. An Efficient Algorithm For Web Service Selection Based On Local Selection In Large Scale. In IEEE, editor, *Proceedings of IEEE International Conference on Awareness Science and Technology (iCAST 2017)*, Taichung, Taiwan, November 2017. IEIE, IEEE.

[paikic-309-038-05:2017] Incheon Paik, Yutaka Koshiba, and Thenuwara Hanadige Akila Sanjaya Siriweera. Efficient Service Discovery Using Social Service Network Based on Big Data Infrastructure. In IEEE, editor, *Proceedings of IEEE 11th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSOC 2017)*, Seoul, Korea, September 2017. IEEE, IEEE CPS.

[paikic-309-038-06:2017] Yujie Li, Benying Tan, Shuxue Ding, Incheon Paik, and Atsunori Kanemura. Key Frame Extraction from Video Based On Determinant-Type of Spare Measure And DC Programming. In IEEE, editor, *Proceedings of IEEE 11th International Symposium on Embedded Multicore/Many-core Systems-on-Chip (MCSOC 2017)*, Seoul, Korea, September 2017. IEEE, IEEE CPS.

[paikic-309-038-07:2017] Kazuki Sasaki and Incheon Paik. Analysis of Data Distribution to Classify Documents on Taxonomy Hierarchy. In IEIE, editor, *Proceedings of The 32nd International Technical Conference on Circuits/Systems, Computers and Communications*, Busan, Korea, July 2017. IEIE, IEIE.

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- [paikic-309-038-08:2017] Kento Hayasaka and Incheon Paik. Improving Taxonomical Document Classification Using Explicit Semantic Analysis and Convolutional Neural Network. In IEIE, editor, *Proceedings of The 32nd International Technical Conference on Circuits/Systems, Computers and Communications*, Busan, Korea, July 2017. IEIE, IEIE.
- [paikic-309-038-09:2017] Rupasingha A. H. M. Rupasingha, Incheon Paik, and B. T. G. S. Kumara. Improving Web Service Clustering through a Novel Ontology Generation. In IEEE, editor, *Proceedings on IEEE International Conference on Web Service 2017*, Hawaii, U.S.A, September 2017. IEEE, IEEE CPS.
- [paikic-309-038-10:2017] T. H. Akila S. Siriweera and Incheon Paik. QoS and Customizable Transaction-aware Selection for Big Data Analytics. In IEEE, editor, *Proceedings on IEEE International Conference on Service Computing 2017*, Hawaii, U.S.A, September 2017. IEEE, IEEE CPS.
- [paikic-309-038-11:2017] Banage T.G.S. Kumara, Incheon Paik, T. H. Akila S. Siriweera, and Koswatte R. C. Koswatte. QoS Aware Service Clustering to Bootstrap the Web Service Selection. In IEEE, editor, *Proceedings on IEEE International Conference on Service Computing 2017*, Hawaii, U.S.A, September 2017. IEEE, IEEE CPS.
- [paikic-309-038-12:2017] T. H. Akila S. Siriweera and Incheon Paik. Constraint-Driven Dynamic Workflow for Automation of Big Data Analytics based on GraphPlan. In IEEE, editor, *Proceedings on IEEE International Conference on Web Service 2017*, Hawaii, U.S.A, September 2017. IEEE, IEEE CPS.

Unrefereed proceedings of an academic conference

- [o-fu-309-038-03:2017] Naomi Ogasawara and Kenta Ofuji. Status and a linguistic analysis of natural disaster evacuation calls. In *Proceedings of the Noize and Vibration Conference, Japan Acoustic Society*, page 5. Japan Acoustic Society, Japan Acoustic Society, March 2018.
- [o-fu-309-038-04:2017] KenIchiro Nishio and Kenta Ofuji. CO2 mitigation and lock-in issues: with focus on residential heat pumps. In *Proceedings of the 34th Energy Systems, Economy and Environment Conference*. Japan Society of Energy and Resources, January 2018.

[o-fu-309-038-05:2017] Kenta Ofuji and Osamu Kimura. Do organizational behaviours actually promote energy efficiency? Evidence from Japanese commercial and industrial sector data. In *Proceedings of the 34th Energy Systems, Economy and Environment Conference*. Japan Society of Energy and Resources, January 2018.

[o-fu-309-038-06:2017] Naomi Ogasawara and Kenta Ofuji. Linguistic analysis of natural disaster evacuation calls. In *Autumn conference, Japan Acoustic Society*, pages 1–5–12. Japan Acoustic Society, September 2017.

[o-fu-309-038-07:2017] Makiko Nemoto Junko Sekiguchi Kenta Ofuji, Masahiro Sagara and Hideko Suzuki. An attempt to insinuate a dietary habit story behind questionnaire data - a path analysis of Fukushima dietary habit survey -. In *Fukushima-ken Hoken Eisei Gakkai(Fukushima Society of Health and Hygiene) 2017 Annual Conference*. Fukushima-ken Hoken Eisei Gakkai(Fukushima Society of Health and Hygiene), September 2017.

[o-fu-309-038-08:2017] Makiko Nemoto Junko Sekiguchi Kenta Ofuji, Masahiro Sagara and Hideko Suzuki. How many respondents were necessary? - a power analysis of Fukushima dietary habit survey -. In *Fukushima-ken Hoken Eisei Gakkai(Fukushima Society of Health and Hygiene) 2017 Annual Conference*. Fukushima-ken Hoken Eisei Gakkai(Fukushima Society of Health and Hygiene), September 2017.

[o-fu-309-038-09:2017] Kenta Ofuji. A statistical analysis of commercial sector building electricity usage - Change before and after subsidized BEMS installation -. In *Japan Society of Public Utilities Economics, Hokkaido and Tohoku Branch Annual Meeting*. Japan Society of Public Utilities Economics, September 2017.

Writing a part of textbook or technical book

[paikic-309-038-13:2017] B. T. Kumara, I. Paik, and K. R Koswatte. *Hybrid Term-Similarity-Based Clustering Approach and Its Applications*, chapter 18, pages 397–423. In *Handbook of Research on Investigations in Artificial Life Research and Development*. IGI Global, 2018.

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Research grants from scientific research funds and public organizations

[paikic-309-038-14:2017] Incheon Paik. Japan Society for the Promotion of Science, Kakenhi, 2016-2018.

Academic society activities

[paikic-309-038-15:2017] Incheon Paik, September 2017.

Special Session Chair, IEEE MCSOC 2017.

[paikic-309-038-16:2017] Incheon Paik, 2017.

Chair of IEICE Service Computing Technical Committee.

[paikic-309-038-17:2017] Incheon Paik, 2017.

Program Committee Member, IEEE ICWS 2017.

Advisor for undergraduate research and graduate research

[o-fu-309-038-10:2017] Narumi Araki. Graduation Thesis: Analysis of disaster evacuation calls from word usage - a statistical analysis verified by an impression survey -, University of Aizu, 3 2018.

Thesis Advisor: K. Ofuji

[o-fu-309-038-11:2017] Ayaka Shiraishi. Graduation Thesis: Dietary Differences of Local Health Activists: A Statistical Analysis, University of Aizu, 3 2018.

Thesis Advisor: K. Ofuji

[o-fu-309-038-12:2017] Haruki Kadohira. Graduation Thesis: Classify food intake group by using factor analysis - An example of Aizu-Wakamatsu city -, University of Aizu, 3 2018.

Thesis Advisor: K. Ofuji

[o-fu-309-038-13:2017] Tomoya Haruta. Graduation Thesis: Do energy management practices in enterprises lead to actual efficiency actions?, University of Aizu, 3 2018.

Thesis Advisor: K. Ofuji

[paikic-309-038-18:2017] Sheng Zhang. An Efficient Algorithm for Web Service Selection Based on Genetic Local Selection in Large Scale, University of Aizu, 2018.

Master Thesis Advisor: Incheon Paik

[paikic-309-038-19:2017] Yui Takeda. Readability Categorization of Eiken Documents Using Machine Learning, University of Aizu, 2018.

Master Thesis Advisor: Incheon Paik

[paikic-309-038-20:2017] Yuji Ishizuka. On-line Cost-aware Workflow Allocation in Heterogeneous Computing Environments, University of Aizu, 2018.

Master Thesis Advisor: Incheon Paik

[paikic-309-038-21:2017] Hiromi Hamaguchi. Classification of Machine-Translated Sentence Using Machine Learning, University of Aizu, 2018.

Graduation Thesis Advisor: Incheon Paik

[paikic-309-038-22:2017] Ryo Ataka. Taxonomy classification with clustered ESA and Machine learning, University of Aizu, 2018.

Graduation Thesis Advisor: Incheon Paik

[paikic-309-038-23:2017] Kazuki Omine. Classification of taxonomical relationships between words by word embedding and machine learning, University of Aizu, 2018.

Graduation Thesis Advisor: Incheon Paik

[paikic-309-038-24:2017] Takeyuki Miyagi. Social Service Network Construction using Word Embedding for Efficient Service Discovery, University of Aizu, 2018.

Graduation Thesis Advisor: Incheon Paik

Others

[paikic-309-038-25:2017] Akila Siriweera and Incheon Paik. QoS aware Traffic Efficient Web Service Selection in BigData Space. 22nd IEICE Service Computing Branch Meeting Technical Report, 2017.

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- [paikic-309-038-26:2017] Incheon Paik and Kazuki Sasaki. Correlation Between Taxonomy Data Distribution and Classification Performance. 22nd IEICE Service Computing Branch Meeting Technical Report, 2017.
- [paikic-309-038-27:2017] Kento Hayasaka and Incheon Paik. Taxonomy Classification By Explicit Semantic Analysis & Deep Machine Learning. 22nd IEICE Service Computing Branch Meeting Technical Report, 2017.
- [paikic-309-038-28:2017] Rupasingha Arachchilage Hiruni Madhusa Rupasingha and Incheon Paik. Domain Information Measure with Novel Ontology Generation for Web Service Clustering. 22nd IEICE Service Computing Branch Meeting Technical Report, 2017.
- [paikic-309-038-29:2017] Akila Siriweera and Incheon Paik. Customizable Transaction and QoS-aware Selection Approach for Big Data Analytics Automation on the Automatic Service Composition. 22nd IEICE Service Computing Branch Meeting Technical Report, 2017.
- [paikic-309-038-30:2017] Takeyuki Miyagi and Incheon Paik. Service Discovery on Service Network Constructed by Word Embedding. 22nd IEICE Service Computing Branch Meeting Technical Report, 2017.
- [paikic-309-038-31:2017] Chungho Lee and Incheon Paik. Real-time Trend Analysis of Streaming Twitter and News Based on Big Data Infrastructure. 23rd IEICE Service Computing Branch Meeting Technical Report, 2017.
- [paikic-309-038-32:2017] Incheon Paik. Tutorial: Toward Semantic Deep Learning Service - Automating Deep Learning Generation. 25th IEICE Service Computing Branch Meeting Technical Report, 2018.
- [paikic-309-038-33:2017] Akila Siriweera and Incheon Paik. Constraint-aware Workflow for Automation of Big Data Analytics based on GraphPlan. 25th IEICE Service Computing Branch Meeting Technical Report, 2018.

Contributions related to syllabus preparation

- [o-fu-309-038-14:2017] Syllabus: Graduate School, Univ. of Aizu: PMC01A Managerial Economics

Scholarly paper prepared by undergraduate/graduate student(s) you advised

[paikic-309-038-34:2017] Wuhui Chen, Incheon Paik, and Neil Y. Yen. Discovering internal social relationship for influence-aware service recommendation. *Multimedia Tools and Applications, Springer*, 76(18):18193–18220, September 2017.

Contribution related to the selection of library or textbook materials

[paikic-309-038-35:2017] Library committee member

Contribution related to the building or operation of the university computer system

[paikic-309-038-36:2017] Member of several working groups such as new system replacement, operation management, etc managed by ISTC

Contribution related to planning administration for research, research conferences, or international research

[paikic-309-038-37:2017] Program committee member of several international conferences such IEEE ICWS, IEEE SCC, IEEE iCAST, IEEE MCSOC, etc

[paikic-309-038-38:2017] Director of IEIE Japan Society

Other significant contribution toward university planning, management, or administration

[paikic-309-038-39:2017] Vice Director of ISTC

[paikic-309-038-40:2017] Member of AAC

[paikic-309-038-41:2017] Chair of the UoA Community Affairs Planning Committee

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[paikic-309-038-42:2017] Member of the University of Aizu Employment Duty Related
Invention Deliberation Council

**Did you participate in Public Lectures, and/or Open Campus?
(Yes or No) If yes, please describe what you did.**

[paikic-309-038-43:2017] Attended Open Lab