Dr. Kristina P. Sinaga

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Curriculum Vitae

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DOCTORAL RESEARCH

"Multi-view Fuzzy Clustering Algorithms for Multi-view Data"
Advised by: Prof. Miin Shen Yang

My PhD research revolved around single-view learning, multi-view learning, feature reduction, and collaborative fuzzy c-means discovery algorithms. In my dissertation, I investigated the structures between feature views in multi-view scenarios to better understand the structure-property-relationship processing of multi-view data. More specifically, I am interested in how single or multiple feature elements can be combined in retrieval, recognition, and reasoning tasks performed by intelligent system of k-means and fuzzy C-mean clustering.

WORK EXPERIENCE

MAY 2022, FROM NOV 2020 (FT)

Bina Nusantara University, Indonesia
(Lecturer)

My responsibilities include developing course materials and curriculum, stimulating meaningful discussions, attending conferences, conferring with other researchers and professionals, guiding/teaching undergraduate and graduate students, grading assignments, and serving as a member of the University.

SEPT 2016 – AUG 2020 (FT)

Chung Yuan Christian University, Taiwan
PhD Researcher

My main task as a PhD researcher was to conduct research to produce new knowledge, applications or insights at the cutting edge of the discipline and to adapt the research plan in light of unexpected problems. In detail, my PhD research revolved around single-view learning, multi-view learning, feature reduction, and collaborative fuzzy c-means discovery algorithms. It is worth mentioning that I developed a novel machine learning architecture that simultaneously distinguishes the relevancy of one feature both in local and global steps without hurting the performance. Moreover, it also made it possible to update the affinity matrix of variables by measuring the agreement/disagreement terms across views (applies single-view learning algorithms directly) in multi-view data. By selecting the most important elements in the view, we were able to reduce the size of the elements by adjusting the thresholds. The new approach was also developed as a general extension of k-means to find the optimal number of clusters. Furthermore, the new design has been successfully applied to various available/public/open datasets without initialization and automatic retrieval of cluster numbers using the concept of entropy (proportion of one data point belonged to one class and the feature weight).

PROFESSIONAL SERVICE

PEER REVIEWER	IEEE Access, IEEE TKDE, Information Fusion (Elsevier) WCCI2022, Applied Soft Computing (Elsevier)

EDUCATION

2016 – 2020	**PhD, Applied Mathematics** FIRST CLASS HONORS Applied Mathematics *Chung Yuan Christian University*
2014 – 2015	**Master of Science** Mathematics *University of Sumatera Utara*
2011 – 2013	**Bachelor of Science** Mathematics *University of Sumatera Utara*

AWARDS

2020	**The Phi Tau Phi Scholastic Honor Society the Republic of China** *Chung Yuan Christian University*
2018	**The recipient of JST** *Niigata University*
2018	**MOST Travel Grant** *The Ministry of Science and Technology (MOST) Taiwan*
2017	**The recipient of JASSO** *Niigata University*
2016 – 2020	**The recipient of CYCU International Student Scholarship** *Chung Yuan Christian University*

COMPUTER SKILLS

BEGINNER	HTML, GitLab
INTERMEDIATE	Python, R Studio, Jupyter Notebook Editor Mathtype, Weka
EXPERT	Matlab, LaTeX

COMMUNICATION SKILLS

TEACHING	Undergraduate and Graduate Program BINUS University – 2021
TEACHING	Undergraduate and Graduate Program BINUS University – 2022
CONFERENCES	Oral Presentation at the International Conferences ICORIS – 2021
TEACHING	Undergraduate and Graduate Program BINUS University – 2020

LICENSES & CERTIFICATIONS

2022 **DeepLearning.AI TensorFlow Developer Professional Certificate**
Issuing organization: Coursera
Taught by: Laurence Moroney

2022 **Machine Learning Specialization**
Issuing organization: Coursera
Taught by: Andrew Ng

2022 **Neural Networks and Deep Learning**
Issuing organization: Coursera
Taught by: Andrew Ng

2022 **Programming for Everybody (Getting Started with Python)**
Issuing organization: Coursera
Taught by: Charles Russell Severance

2022 **Understanding and Visualizing Data with Python**
Issuing organization: Coursera
Taught by: Brenda Gunderson, Brady T. West
Taught by: Kerby Shedden

2022 **Tools for Data Science**
Issuing organization: Coursera
Taught by: Aije Egwaikhide, Svetlana Levitan
Taught by: Romeo Kienzler

2022 **Python for Data Science, AI & Development**
Issuing organization: Coursera
Taught by: Aije Egwaikhide, Svetlana Levitan
Taught by: Romeo Kienzler

TEACHING

GRADUATE PROGRAM	Business Intelligence and Analytics
UNDERGRADUATE PROGRAM	Discrete Mathematics Calculus I

REFERENCES

Dr. Miin-Shen Yang

POSITION Professor
EMPLOYER Department of Applied Mathematics
Chung Yuan Christian University
EMAIL msyang@math.cycu.edu.tw

Dr. Gerhard-Wilhelm Weber

POSITION Professor
EMPLOYER Poznan University of Technology
EMAIL gerhard.weber@put.poznan.pl

Dr. Tamaki Tanaka

POSITION Professor
EMPLOYER Graduate School of Science and Technology
EMPLOYER Niigata University
EMAIL tamaki@math.sc.niigata-u.ac.jp

POSTERS Poster Presentation at the International Conferences ICAISC, Zakopane, Poland– 2018

RESEARCH PRESENTATION Joint Seminar and Research Camp Program on Mathematical Science JSRC, Niigata, Japan – 2017

SKILLS

Goal Oriented

I believe in action over long-winded discussions. I listen to everyone's viewpoints and use my judgement to immediately act based on consensus to achieve goals quickly and efficiently.

Pattern Recognition

Developing and designing unsupervised clustering algorithms within single and multi-view data (e.g. the k-means, fuzzy c-means, feature reduction) have contributed to an advancement of pattern recognition systems.

Passionate

I have been interested in Mathematics and programming when I was pursuing my PhD. It was during this period that I realized that I found a great interest on these topics of research because it puts together some of my favorite topics: data analysis, multi-view learning, clustering, image recognition, feature selection, feature reduction, k-means, fuzzy c-means, collaborative learning, and algorithms. My education and research have cemented this interest into a passion. I greatly enjoy carrying out Multi-view learning, machine learning, and deep learning research with potential practical applications. I deeply interested in learning and implementing multidisciplinary approaches to complex questions.

PUBLICATIONS

Journal Articles

Yang, M. S., **Sinaga, K. P.** (2021). Collaborative feature-weighted multi-view fuzzy c-means clustering. *Pattern Recognition*, *119*, 108064.

Sinaga, K. P., Hussain, I., Yang, M. S. (2021). Entropy K-means clustering with feature reduction under unknown number of clusters. *IEEE Access*, *9* pp: 67736-67751.

Sinaga, K. P., Yang, M. S. (2020). Unsupervised K-means clustering algorithm. *IEEE Access*, *8* pp: 80716-80727.

Yang, M. S., **Sinaga, K. P.** (2019). A feature-reduction multi-view k-means clustering algorithm. *IEEE Access*, *7* pp: 114472-114486.

Ongoing Articles

Hussain, I., **Sinaga, K. P.**, Yang, M. S. Unsupervised multi-view fuzzy c-means.
Sinaga, K. P. A comprehensive validity index for multi-view machine learning.

Sinaga, K. P. Multi-view learning disagreement-based entropy-gaussian-kernel.

Dr. Herman Mawengkang

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EMPLOYER University of Sumatera Utara
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Sinaga, K. P. Regularized multi-label view reduction without supervision.

Books and Chapters

Sinaga, K. P., Hsieh, J. N., Benjamin, J., Yang, M. S. (2018). Modified relational mountain clustering method. *In International Conference on Artificial Intelligence and Soft Computing*, pp: 690-701.

Yuniati, D., **Sinaga, K. P.** (2021). Analytics-Based on Classification and Clustering Methods for Local Community Empowerment in Indonesia. *In International Conference on Soft Computing in Data Science*, pp: 133-145.

Conference Proceedings

Alexandra, J., **Sinaga, K. P.** (2021). Machine learning approaches for marketing campaign in portuguese banks. *In 2021 3rd International Conference on Cybernetics and Intelligent System (ICORIS), IEEE*, pp: 1-6.

Wibowo, J., **Sinaga, K. P.** (2021). Telecommunication Analytics Based on Customer Segmentation Using Unsupervised Algorithms. *In 2021 3rd International Conference on Cybernetics and Intelligent System (ICORIS), IEEE*, pp: 1-6.