

Chen-Hsuan Liao
CURRICULUM VITAE

ADDRESS

Institute of Education
National Yang Ming Chiao Tung University
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EDUCATION

2020 ~	Ph.D.	in Educational Psychology, National Yang Ming Chiao Tung University, Taiwan Advisor: Dr. Jiun-Yu Wu
2016	M.S.	in Electronic Engineering with a concentration in solid physics, (major in 3D device modeling and simulation), National Chiao Tung University, Taiwan Thesis: <i>Modeling the Statistical Variability of Process and Random Telegraph Signals Induced Threshold Voltage Shifts in Nanoscale MOSFETs and FinFETs</i> Advisor: Dr. Ming-Jer Chen Average Score: 88.33 Rank: 14% (23/166)
2014	B.S.	in Electronic Engineering, National Chiao Tung University, Taiwan Average Score: 86.56 Rank: 26% (24/92)

EMPLOYMENT

01/16/2017 ~ 03/02/2020	Engineer	Taiwan Semiconductor Manufacturing Company (TSMC) (N5 R&D Process Integration, N2 R&D Process Integration)
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AWARDS & HONORS

2021	Outstanding Research Award, IED, NYCU
2020	Outstanding Teaching Assistant Award, NYCU
2020	Ministry of Science and Technology Outstanding PhD Scholarship, Taiwan

RESEARCH INTERESTS

I'm interested in the dynamic process of learning motivation which is the key to better academic performance. As AI and e-learning spring up in educational and learning practice, understanding learner motivation is practical and crucial for instructional feedback. However, this research field lacks in-depth research. Thus, my research interests are:

- A. **AI in Education:** Machine Learning, Deep Learning, Data Visualization.
- B. **Quantitative Methodologies:** ANOVA, Chi-Squared Test, Regression, Multivariate Analysis, EFA, CFA, Path Analysis, Structural Equation Modeling.
- C. **Qualitative Methodologies:** Text Mining, Content Analysis, WordCloud.
- D. **Substantive fields:** Self-Determination Theory, Achievement Goal Theory, Instructional Strategies, Educational Testing and Measurement

COMPUTATIONAL AND ANALYTICAL SKILLS

Combining the experience of a process integration engineer with a background in electronic device modeling and simulation, I am proficient in big data analysis, using a variety of programming languages and software packages for different types of data. With a view to applying my analytical skills to educational fields, I can further combine web crawling, machine learning and deep learning techniques with data visualization skills and advanced statistical analysis to summarize insightful information behind these structured and unstructured data.

Statistics	✓	Perform a big data analysis by using R, SPSS, Mplus, LISREL, Python, Excel.
Web Crawling	✓	Create crawlers or robots (e.g. Facebook, Youtube, WOS, ERIC) for data mining by using Python.
Machine Learning	✓	Use machine learning algorithms for modeling, label classification, prediction by incorporating R and Python
Data Visualization	✓	Create educational dynamic dashboard by combining R, Python, Google Sheet, Google Data studio, and Google Cloud Platform.

PUBLICATIONS

A. Peer Reviewed Journal Articles (*Corresponding author)

1. **Liao, C.-H.**, Wu, J.-Y.* (2022). Deploying multimodal learning analysis models to explore the impact of digital distraction and peer learning on student performance. *Computers and Education*. <https://doi.org/10.1016/j.compedu.2022.104599>
2. Wu, J.-Y.*, **Liao, C.-H.**, Nian, M.-W., & Cheng, T. (2021, January). Using data analytics to investigate attendees' behaviors and psychological states in a virtual academic conference. *Educational Technology & Society*, 24(1) - Special Issue on "Online synchronous conference."
3. Wu, J.-Y.*, Yang, C.C.Y., **Liao, C.-H.**, & Nian, M.-W. (2021, January). Analytics 2.0 for precision education: an integrative theoretical framework of the human and machine symbiotic learning. *Educational Technology & Society*, 24(1) - Special Issue on "Precision Education - A New Challenge for AI in Education."

B. Conference Articles (*Corresponding author)

1. **Liao, C.-H.**, Hsu, Y.-S., Wu J.-Y.* (2022). *Implementing a personal learning environment with learning dashboard in statistics courses and investigating its effect on statistical anxiety*. Paper presented at the 26th Global Chinese Conference on Computers in Education (GCCCE 2022), online.
2. Ho, Y.-L., Chou, C., **Liao, C.-H.**, & Wu, J.-Y.* (2022, November 28-December 2). *Using unsupervised machine learning to model Taiwanese high-school students' digital distraction profiles concerning Internet gaming disorder*. Paper will be presented at the 2022 International Conference on Computers in Education (ICCE 2022). Kuala Lumpur, Malaysia.

3. Weng, M.-C., Liao, C.-H., Wu, J.-Y.* (2022). *Learners' social goals and their engagements in blended learning statistics classrooms*. Paper presented at the 2022 American Educational Research Association Annual Meeting (AERA 2022) , online.
4. Hsu, Y.-S., Liao, C.-H., and Wu J.-Y.* (2022). *The impact of learning analytics dashboard use on graduate students' academic procrastination behavior*. Paper presented at 2022 Taiwan E-Learning Forum (TWELF 2022). National Taitung University, Taiwan.
5. Huang-Fu, C.-Y., Liao, C.-H., Wu, J.-Y.* (2021, July). *Comparing the performance of machine learning and deep learning algorithms classifying messages in Facebook learning group*. Paper presented at the 21st IEEE International Conference on Advanced Learning Technologies (ICALT 2021), online.
6. Nian, M.-W., Liao, C.-H., Wu, J.-Y.* (2021, January). *Exploring the relationship between students' interactions and learning outcomes in the Facebook learning group of the blended courses*. Paper presented at the 2020 National Chair Professorship Series: "Forward thinking, Interdisciplinary Research" Postgraduate Research Excellence Conference. National Taiwan Normal University, Taiwan.
7. Ho, Y.-L., Liao, C.-H., Weng, M.-J., Cheng, T.-Y., and Wu J.-Y.* (2021). *The preliminary analysis of the association between Taiwan senior high school students' digital distraction, learning procrastination, and autonomous learning*. Paper presented at Taiwan Association for Educational Communications and Technology (TAECT 2021)
8. Hsu, Y.-S., Liao, C.-H., and Wu J.-Y.* (2021). *Exploring the influence of online learners' academic procrastination disposition and procrastination degree on their academic performance*. Paper presented at 2021 Chinese Association of Psychological Testing Annual Meeting, online.
9. Ho, Y.-L., Liao, C.-H., and Wu J.-Y.* (2021), *Investigate the mediation effect of independence learning tendency between self-regulation strategy and learning performance in a Taiwanese high school*. Paper presented at 2021 National Chair Professorship Series: "Forward thinking, Interdisciplinary Research" Postgraduate Research Excellence Conference. National Taiwan Normal University, Taiwan.

PROFESSIONAL SERVICE

2022.02 ~ 2022.06	Teacher Assistant of Research on Advanced Applied Statistics, IED, NYCU
2021.09 ~ 2022.01	Teacher Assistant of Introduction to Applied Statistics, IED, NYCU
2021.09 ~ 2022.01	Teacher Assistant of Applied Multivariate Analysis and Machine Learning, IED, NYCU
2021.02 ~ 2021.06	Teacher Assistant of Introduction and Implementation of Data Analysis, IED, NYCU

2021.02 ~ 2021.06	Teacher Assistant of Structural Equation Modeling, IED, NYCU
2021.02 ~ 2021.06	Teacher Assistant of Research on Advanced Educational Statistics, IED, NYCU
2020.09 ~ 2021.01	Teacher Assistant of Applied Multivariate Analysis and Machine Learning, IED, NCTU
2020.09 ~ 2021.01	Teacher Assistant of Educational Psychology, IED, NCTU
2020.09 ~ 2021.01	Teacher Assistant of Introduction to Educational Statistics, IED, NCTU
2020.02 ~ 2020.07	Teacher Assistant of Advanced Educational Statistics, IED, NCTU

REFeree

Ph.D. Advisor: Dr. Jiun-Yu Wu

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