WEI-HUNG WENG
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Summary

- A medical doctor, and a self-taught data science lover
- Exploring clinical and -omic data to assist clinical decision making and personalized medicine

Education

Sep 2015- **Harvard Medical School (HMS),** Boston, MA
Candidate of Master of Medical Science in Biomedical Informatics (current GPA 4.0/4.0)
- Clinical informatics, machine learning, natural language processing, bioinformatics, computational biology
- Managing 4 collaborative research with HMS, MIT and Massachusetts General Hospital
- Lab director of HMS BMI701: Introduction of biomedical informatics
- Mentor in MIT-TMU hackathon
- Student representative of curriculum committee in the program
- Scholarship of Harvard University Alumni Association in Taiwan (2015)
- Wang Yuan-Chun Memorial Medical Contribution Scholarship, Taiwan (2015)

Sep 2004 - Jun 2011 **Chang Gung University,** Taoyuan, Taiwan (first tier medical school in Taiwan)
Doctor of Medicine (M.D.) (GPA: 3.99/4.0, Rank: 5/106)
- Presidential Award 5 times (for top 5% students)
- 2 teaching assistant/recitation experiences in the 105 students class, 1 year class leadership
- Board Certificate of Medical Doctor in Taiwan, Certificate of Advanced Cardiovascular Life Support
- Harvard Medical School, Exchange Student (Massachusetts Eye and Ear Infirmary) (Jun 2011)

Professional Experience | Research

Sep 2015 - **Laboratory of Computer Science, Massachusetts General Hospital (MGH), MA** (top-ranked hospital in USA)
Research Fellow (Advisor: Dr. Henry Chueh [Director of LCS in MGH])
- Designing and developing clinical expert recommendation system
  - Developing R/python NLP and machine learning pipeline for processing unstructured clinical data
  - Improving the performance of existed projects 'Expertaj' by implementing the machine learning-based algorithms and ontology-based database
- Medical concept extraction and matching of undiagnosed disease patients by natural language processing and medical ontology (collaborate with HMS DBMI)
- Investigating relative hypoglycemia using MIMIC database (collaborate with MIT)
- Improving the outcome of kidney transplantation patients by using mobile-based educational modules and data analysis (collaborate with Brigham and Women's Hospital (BWH), semi-finalist of BWH startup program)

Sep 2016 - May 2017 **Department of Neurology , Massachusetts General Hospital (MGH), MA** (top-ranked hospital in USA)
Research Assistant (Advisor: Dr. Michael B. Westover)
- Predicting potential refractory epilepsy using clinical notes by word embedding and deep neural network
- Analyzing cost-effectiveness decision of using continuous EEG on post resuscitation patients

Jun 2016 - Aug 2016 **Division of Clinical Informatics Solutions and Services, Philips Research North America, MA**
Research Internship (Advisor: Dr. Sandeep Dalal)
- Designing and implementing the anatomy extraction module for radiology or clinical reports using NLP, ontology, neural word embedding and deep learning methods (python module, delivered product)

May 2014 - Apr 2015 **Molecular Imaging Center, National Taiwan University, Taiwan** (rank #1 in Taiwan)
Research Associate (Advisor: Prof. Chi-Kuang Sun [Director of Center. SPIE, IEEE, OSA Fellow])
- Developed a method to identify skin melanocytes in noninvasive microscopic imaging modality
- Managed collaborative image deep learning projects with two academic institutes
- Assisted strategic planning of commercializing virtual biopsy microscopy, which meets the unmet need that can reach more than three million population with the risk of skin cancer
- First Prize Award. HIT Biomedical Innovation Hackathon

Jun 2008 - May 2011 **Kidney Research Center / Cancer Molecular Diagnostics Lab / Department of Psychology, Chang Gung Memorial Hospital, Taiwan**
Undergraduate Research Assistant (Advisor: Prof. Ya-Chung Tian, Prof. Lee-Yung Shih, Prof. Chin-Yen Chen)
- Investigated cytokines effects on polyomavirus BK infection

- Clinical data analysis of concomitance of essential thrombocythemia and chronic myeloid leukemia
- Investigated the relationship between sleepiness scale and heart rate variability in medical students
- Great Honor. Taiwan Medical Development Awards for Outstanding Writings. Taiwan (grant award)
- Research Funding. Medical Foundation in Memory of Dr. Deh-Ling Cheng. Taiwan (grant award)

Jul 2009 - Aug 2009 **Cancer Immunology and Gene Therapy Lab, Johns Hopkins Medical Institute, MD**
Summer Research Assistant (Advisor: Prof. Tzyy-Choou Wu [Director of Laboratory])
- Journal article writing and literature reviews, immunology/molecular cell biology techniques training

Professional Experience | Clinical

Aug 2012 - Apr 2014 / Jun 2010 - May 2011 **Chang Gung Memorial Hospital**, Linkou, Taiwan (the largest medical center in Taiwan)
Resident Physician in Pathology and General Medicine / Rotating Internship
- Supervised more than 10 medical clerks, interns and residents
- Selected as visiting scholar to Department of Pathology, University of Tokyo Hospital, Tokyo, Japan
- Won OSCE Award. Taiwan Association of Medical Education
- Won 2nd Prize in Medical Record Writing Competition

Jul 2012 **Mbanane Government Hospital**, Mbabane, Hhohho, Swaziland (the largest hospital in Swaziland)
Resident Physician (Medical volunteer of Taiwan Medical Mission in Swaziland)
- Two rural and suburban outreaches, and critical ward care

Aug 2011 - Jul 2012 **Republic of China Army**, Chungli, Taiwan
Medical Officer of Health, Secondary Lieutenant
- Managed a medical clinic, and a shelter for soldiers with psychiatric diseases

Publications [2 first-authored and 3 co-authored, all SCI journals]

1. **Weng, W.-H.**, Liao, Y.-H., Tsai, M.-R., Huang, H.-Y., Sun, C.-K. (2016). Differentiating intratumoral melanocytes from Langerhans cells in non-melanocytic pigmented skin tumors in vivo by using label-free third harmonic generation microscopy. Journal of Biomedical Optics, 21(7), 076009. (IF 2.859)
2. Liu, C.-H., Tang, W.-R., **Weng, W.-H.**, Lin, Y.-H., & Chen, C.-Y. (2016). The process of coping with stress by Taiwanese medical interns: a qualitative study. BMC Med Educ, 16(1). (IF 1.218, citation: 2)
3. Lin, Y.-H., Chen, C.-Y., Lin, S.-H., Liu, C.-H., **Weng, W.-H.**, Kuo, T. B. J., & Yang, C. C. H. (2013). Gender differences in cardiac autonomic modulation during medical internship. Psychophysiology, 50(6), 521–527. (IF 2.986, citation: 13)
4. **Weng, W.-H.**, & Shih, L.-Y. (2011). Occurrence of BCR-ABL1-Positive Chronic Myeloid Leukemia following Essential Thrombocythemia. Acta Haematologica, 126(4), 220–223. (IF 1.116, citation: 1)
5. Hung, C.-F., Monie A., **Weng, W.-H.**, Wu, T.-C. (2010). DNA vaccines for cervical cancer. Am J Transl Res, 2(1), 75-87. (IF 3.402, citation: 37)

Conferences [8 first authored and 5 co-authored]

1. **Weng, W.-H.**, Khatri, A., Wagholikar, K. B., Cohen, A. B., Chueh, H. C. (2016, November). Improving the Workflow of Curbside Consultation by Using Unstructured Clinical Notes - a Natural Language and Machine Learning-based Approach. AMIA 2016 Annual Symposium, Chicago, IL.
2. **Weng, W.-H.**, Wagholikar, K. B. (2016, November). Supervised Clinical Document Classification Pipeline. AMIA NLP WG Pre-Symposium, Chicago, IL.
3. **Weng, W.-H.**, Liao, Y.-H., Tsai, M.-R., Huang, H.-Y., Sun, C.-K. (2016, March). Differentiating intratumoral melanocytes from Langerhans cells in non-melanocytic pigmented skin tumors in vivo by using third harmonic generation microscopy. Focus on Microscopy Conference 2016, Taipei, Taiwan.
4. Huang, H.-F., **Weng, W.-H.**, Hsu, Winston H., Sun, C.-K., (2015, December). Automated Detection of Noninvasive Imaging of Basal Cell Carcinoma by Convolutional Neural Network. NIPS 2015 Workshop on Machine Learning in Healthcare, Montreal, Canada.
5. Chou, Y.-H., Hung, S.-Y., Lee, G.-G., **Weng, W.-H.**, Liao, Y.-H., Sun, C.-K., Shih, H.-T. (2015 July). Nuclei location enhancement based on improved efficient ellipse hough transform for third harmonic generation microscopy imaging. IEEE ChinaSIP 2015, Chendu, China.
6. Liao, Y.-H., **Weng, W.-H.**, Sun, C.-K. (2015, June). Characterization of dendritic cells in pigmented skin tumors by harmonic generation microscopy. 23rd World Congress of Dermatology, Vancouver, Canada.
7. Lee, G.-G., Cai, C.-S., Liao, Y.-H., **Weng, W.-H.**, Sun, C.-K., Tsai, M.-R., Hung, S.-Y., Huang, C.-H., Shih, H.-T., Yu, Z.-H. (2015, May). Quantitative Gabor feature analysis of collagen fibers in harmonically generated microscopy (HGM) imaging. OMICS International Global Summit and Expo on Multimedia and Applications ETMN Pre-conference Workshop 2015, Kaohsiung, Taiwan.
8. **Weng, W.-H.**, Tsai, M.-R., Liao, Y.-H., Sun, C.-K. (2015, February). Differentiating pigmented skin tumors by the tumor-associated melanocytes based on in vivo third harmonic generation microscopy. SPIE Photonics West 2015, San Francisco, CA.
9. Lee, S.-Y., **Weng, W.-H.**, Sun, C.-K. (2015, February). Super resolution brain imaging by using a two-photon fluorescence microscopy with harmonic modulation. SPIE Photonics West 2015, San Francisco, CA.
10. **Weng, W.-H.**, Tsai, M.-R., Liao, Y.-H., Sun, C.-K. (2014, November). Identifying melanocyte in pigmented skin lesions based on in vivo third harmonic generation microscopy. Biomedical Molecular Imaging 2014. Taipei, Taiwan.
11. **Weng, W.-H.**, Liu, W.-M., Tsai, M.-R., Liao, Y.-H., Sun, C.-K. (2014, November). In vivo quantification of melanin mass density in human by using third harmonic generation microscopy. Biomedical Molecular Imaging 2014. Taipei, Taiwan.

12. **Weng, W.-H.,** Tian, Y.-C. (2010, August). Interleukin-1 beta Inhibits BK virus gene expression and replication in human renal proximal tubular epithelial cells. Taiwan Medical Development Awards for Outstanding Writings. Taipei, Taiwan.
13. **Weng, W.-H.,** Tian, Y.-C. (2009, September). IL-1 has suppressive effect on BKV replication. Summer Student Study for Infectious Disease. Kaohsiung, Taiwan.

Verified Certifications and Professional Development

- Introduction to Computer Science and Programming Using Python. **MITx (edX).** Python, data structure, algorithm
- Genomics Data Analysis. **HarvardX (edX).** (3 courses). Bioconductor, genomics computing, functional genomics
- Data Science Specialization (10 courses) / Mathematical Biostatistics. **Johns Hopkins University (Coursera)**.
  - R programming, data science, statistical inference, regression, machine learning, reproducible research, NLP
- Machine Learning. **Stanford University / National Taiwan University (Coursera).**
- Natural Language Processing. **Stanford University / Columbia University (Coursera),** …

Language / Skills / Other

- English (fluent), Chinese (native), Taiwanese (native), Japanese (basic)
- Expertise in R, Python, SQL, Linux, bioconductor, cTAKES, MetaMap, medical ontology and database (UMLS, SNOMED-CT, HPO, FMA, MIMIC, …), LaTeX, Tableau, Matlab, ImageJ, Fiji
- Developed iOS App 'LabBuddy' (more than 10,000 downloads)
- Yearbook designer (medical school), teaching fellow in medical camps and Biology Club, photography, cycling, swimming
- Core member of Investigator Biosciences Society Taiwan (web, design)