WEI-HUNG WENG
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Summary

- A clinical doctor, pathologist, biomedical informatician, and a data science researcher would like to integrate clinical, histopathological and -omic data and build an intelligent system for precision medicine
- Expertise in R, Python, SQL, Linux, bioconductor, ImageJ, LaTeX, Tableau, machine learning, deep learning, natural language processing (NLP) techniques (cTAKES, MetaMap), medical ontology and database (UMLS, SNOMED-CT, HPO, FMA, MIMIC)

Education

Sep 2015- **Harvard Medical School (HMS),** Boston, MA
Candidate of Master of Medical Science in Biomedical Informatics (current GPA 4.0/4.0)
- Four collaborative researches with HMS, MIT and Massachusetts General Hospital
- Lab director of HMS course (BMI701: Introduction of biomedical informatics)
- 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 five times (for only top 5% students)
- Two teaching assistant/recitation experiences in the 105 students class, one year of 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)

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)**

Research Experience

Sep 2015 - **Laboratory of Computer Science / Department of Neurology, Massachusetts General Hospital (MGH), MA**
Research Fellow (Advisor: Dr. Henry Chueh [Director of LCS in MGH], Dr. Michael Westover)
- Initiating the project of clinical expert recommendation system using NLP, ontology and machine learning
- Redefining glycemic control for critically ill patients using large critical care database mining
- Identifying medical concepts in the unstructured clinical data for undiagnosed disease patients
- Improving the outcome of kidney transplantation patients by data-driven mobile educational modules
- Predicting potential refractory epilepsy using clinical notes by deep neural network
- Analyzing cost-effectiveness decision of using continuous EEG on post resuscitation patients
- Three conference presentations, with one of them as the NLP and machine learning technical provider

Jun 2016 - Aug 2016 **Division of Clinical Informatics Solutions and Services, Philips Research North America, MA**
Research Internship (Advisor: Dr. Sandeep Dalal)
- Initiated the anatomy extraction project for radiology reports using ontology and neural word embedding

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 the qualitative and deep learning methods to identify skin melanocytes in microscopic imaging
- Proposed a go-to market strategy of virtual biopsy microscopy for skin cancer detection
- First Prize Award. Proposed an automatic fetal heart beat detector. HIT Biomedical Innovation Hackathon
- One first-author peer-reviewed original article publication and four first-author conference presentations

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)
- Three peer-reviewed original research publications and two conference presentations
- Investigated cytokines effects on polyomavirus BK infection, and won two research grant awards
- 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

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])
- One review article publication, and immunology/molecular cell biology techniques training

Clinical Experience

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

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
- Volunteered in Mbanane Government Hospital in Swaziland, for critical ward care and rural outreaches

Selected Publications and Conferences

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 2016 NLP WG Pre-Symposium, Chicago, IL.
3. **Weng, W.-H.**, Wagholikar, K. B. (2016, November). Classifying Clinical Documents into Medical Domains. AMIA 2016 NLP WG Pre-Symposium, Chicago, IL.
4. **Weng, W.-H.**, Liao, Y.-H., Tsai, M.-R., Huang, H.-Y., Sun, C.-K. (2016, June). 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)**
5. **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.
6. 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)**
7. 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.
8. 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.
9. 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.
10. **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.
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. 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)**
13. **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)**
14. 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)**
15. **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.
16. **Weng, W.-H.**, Tian, Y.-C. (2009, September). IL-1 has suppressive effect on BKV replication. Summer Student Study for Infectious Disease. Kaohsiung, Taiwan.

Invited Talks

1. Deconstructing the Hype around Big Data and Precision Medicine (panelist). Oct 2016. Epoch Foundation. Taipei, Taiwan.
2. MIT-TMU Internet of Things Hackathon (panelist/mentor/judge). Sep 2016. Taipei Medical University. Taipei, Taiwan.

Other

- Developed iOS App 'LabBuddy' (more than 10,000 downloads)
- Teaching fellow in medical camps and Biology Club, Yearbook design (medical school)
- Core member of Investigator Biosciences Society Taiwan (website development and design)