ANNE EN-TZU YANG

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Personal Website | LinkedIn | GitHub | Publications

SKILLS

- **Summary:** 9+ years of modeling and data/signal processing for biomedical science, health and fitness
- **Subjects:** Engineering mechanics, biomechanics, sensing robotics, data science, machine learning, signal processing, mechatronics, software development, data engineering
- **Programming:** Python, Matlab, mySQL, HTML, JavaScript, LaTeX, C#
- **Libraries** Nginx, Gunicorn, Pandas, Matplotlib, Seaborn, Flask, Numpy, Scipy, scikit-learn, statsmodels, XGBoost, PyTorch, TensorFlow, Keras, NLTK, TextBlob, SQLAlchemy, psycopg2, Prophet, azureml
- **Tools:** Git, Github, Anaconda, Jupyter Notebook, Arduino IDE, Microsoft Azure ML pipeline and database

EXPERIENCE

- **Data Scientist**. Apple *09/2021 - present*
- **Senior Data Scientist**. 3M (Health Care Business Group) *02/2020 - 08/2021*
  - Integrated mechanics and health monitoring data to investigate biomechanical safety and treatment efficacy in digital orthodontic treatments (clear-tray aligners).
  - Automated & customized prescriptions of tooth movement with neural network based on customer preference and historical data; deployed solutions to software production environment.
  - Piloted the division's first data science effort (certified Scrum Master and Product Owner)–
    - outlined data opportunities; communicated visions with business leaders and stakeholders
    - automated data engineering for $\sim$60k patients; influenced data acquisition in production
    - assigned and oversaw 4 projects by interns and collaborators; co-inventor of one submitted patent
- **Data Science Fellow**. Insight Data Science *09/2019 - 10/2019*
  - Ideated and constructed the full-stack of a web app in two weeks to recommend best time to ride Paris metro based on time series forecasting of hourly air quality (SMAPE error = 12%).
- **Postdoctoral Researcher**. University of Paris VI *09/2018 - 08/2019*
  - Designed a system of markers that enabled 3D surgical tool monitoring from 2D medical radiography with trained convolutional neural networks (CNN) (inference time $\sim$10 ms/frame; error$<1^\circ$).
- **PhD Candidate**. Northwestern University *09/2012 - 08/2018*
  - Created a rat whisker sensor that detects bending moments at micro-scale through contact-resistive sensing, integrated with Arduino Uno. Initiated a $1M multi-university grant .
  - Modeled the dynamics of rat whiskers as piece-wise tapered beams under contact or airflow.
  - Predicted neural signals (R^2=0.93) from 420 sets of 100-ms data sampled at 10kHz.
- **PhD Intern**. Sanofi *06/2017 - 08/2017*
  - Collaborated with immunologists on asthma modeling and statistics of n = 10k clinical data.

EDUCATION

- **PhD in Mechanical Engineering**. Northwestern University *09/2012 - 08/2018*
- **Certificate of Management**. Kellogg School of Management *06/2016 - 08/2016*
- **BS in Mechanical Engineering**. National Taiwan University *09/2008 - 06/2012*

PUBLICATIONS

- T Furuta, NE Bush, **AET Yang**, S Ebara, N Miyazaki, K Murata, D Hirai, K Shibata, MJZ Hartmann. The cellular and mechanical basis for response characteristics of identified primary afferents in the rat vibrissal system. *Current Biology* (2020)
- **AET Yang**, J Szewczyk. Marker-assisted image-based 3D monitoring for active catheters. *The Hamlyn Symposium on Medical Robotics* (2019)
- **AET Yang**, HM Belli, MJZ Hartmann. Quantification of vibrissal mechanical properties across the rat mystacial pad. *Journal of neurophysiology* (2019)
- **AET Yang**, MJZ Hartmann, S Bergbreiter. Contact-resistive sensing of touch and airflow using a rat whisker. *7th IEEE International Conference on Biomedical Robotics* (2018)
- HM Belli, **AET Yang**, CS Bresee, MJZ Hartmann. Variations in vibrissal geometry across the rat mystacial pad: base diameter, medulla, and taper. *Journal of neurophysiology* (2017)
- **AET Yang**, MJZ Hartmann. Whisking kinematics enables object localization in head-centered coordinates based on tactile information from a single vibrissa. *Frontiers in behavioral neuroscience* (2016)
- NE Bush, CL Schroeder, JA Hobbs, **AET Yang**, LA Huet, SA Solla. Decoupling kinematics and mechanics reveals coding properties of trigeminal ganglion neurons in the rat vibrissal system. *eLife* (2016)