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Summary

- Broad range of technical expertise in data science, material science and instrumental development.
- Uses machine learning (ML) in data inference, pattern identification, data driven decision-making and ML model deployment.
- Detail-oriented, able to independently design and rapid-prototype experiments in a start-up environment. Quick to embrace new technology.
- Six years experience leading a research group, organizing and planning research budgets
- Able to communicate effectively. Authored and co-authored 20 peer reviewed research articles

Education

Stanford University, CA: PhD/MS in Applied Physics, GPA 3.86/4.00 (2006 – 2013)
Brown University, RI: BS in Physics, *Magna Cum Laude*, GPA 4.00/4.00 (2002 – 2006)

Experience

Data Scientist (2018 – current), Python-based machine learning projects
- **Analysis of Air Pollution Data:** Enabled effective environmental policy change by identifying main air pollutant sources. Scraped weather and Bangkok air pollution data, created an SQL database, visualized and feature engineered input data, identified extremely randomized tree regressor as optimal ML prediction model, and isolated main pollutant sources using feature of importance.
- **Predicting US Monthly Electricity Consumption**: Used economic and weather data to predict monthly electricity consumption by state, with more granularity than the US Energy Information Administration short-term energy outlook estimates. Achieved 0.99 R-squared score. Deploy time-series prediction as a web application with Heroku.
- **Health data**: Automated identification of liver disease using blood test data. Feature selection from feature of importance. Achieved 78% accuracy on the validation set (baseline = 72)
- **A/B Testing**: Analyzed data from the popular mobile game, Cookie Cats. Used bootstrap analysis to compare effectiveness of time pause at level 30 and 40 toward user retention.
- **Image classification:** Identified oil palm plantations from satellite images with 0.997 score (leaderboard 0.999). Used convolution neural network (fast.ai). Tackled imbalance dataset using image augmentation.
- **Coursework**: SQL, ML, pyspark (DataCamp.com), deep learning and machine learning (fast.ai), Data Science (Harvard).

Principal Investigator and Professor Lecturer, School of Physics, Suranaree University of Technology (Jan 2013 – Jan 2019)
- **Leadership**: Managed grants and funding for multiple projects; supervised multiple graduate students
- **Industrial Collaboration:** Collaborated with Western Digital (Thailand), Co., Ltd. to identify cause of corrosion in factory production line to find optimal process.
- **Research:** Investigated and explored the properties of novel materials, next generation memory devices, industrial thin films, and biological samples with scanning probe microscopy techniques. Used image analysis, data analysis, and data visualization techniques (python and MATLAB) to provide insight.
- **Quality Assurance**: Wrote QA status, statistics and performance report for graduate physics curriculum. Designed survey and provided insights to key stakeholders.
- **Teaching**: 6 years teaching experience in undergraduate/graduate physics classes. Designed and taught project-based classes, incorporated design thinking and rapid prototyping concepts

Research Assistant, Professor Zhi-Xun Shen Lab, Stanford University (Sep 2006- Jan 2013)
Dissertation: Imaging Nanoscale Electronic Inhomogeneity with Microwave Impedance Microscopy
- **Start-up experience**: Developed novel microscopy technique for nanoscale imaging. Designed control and data acquisition programs for MIM platforms in LabVIEW. Invention commercialized as lab spin-off company (PrimeNano Inc).

- **Research**: Studied nanoscale electronic inhomogeneity of novel materials such as semiconductor devices, graphene, and colossal magnetoresistance manganites.
- **Image Analysis:** Processed and analyzed MIM images to segment and calculate correlation length of repeated pattern in images. Utilized edge detection and cross-correlation for image registration.
- **Microfabrication**: Failure analysis, and tested microfabricated probes and circuits.
- **Simulation**: modeled electromagnetic tip-sample interaction using finite element analysis (COMSOL)

Skills

- **Technical:** Machine Learning, Neural Networks, Time Series Modeling, Data Analysis, NLP, Visualization, Feature Engineering, Web Scraping, Relational Database, Image processing, Image segmentation, Geospatial Data Analysis, ML model deployments
- **Programming**: **Python** (Scikit-Learn, Geopandas, Pytorch, Keras, statsmodels, Bokeh, Requests, Selenium, BeautifulSoup, scrapy, OpenCV), **SQL** (SQLite, Postgres), **NoSQL** (MongoDB), **Cloud Application** (Heroku), **Distributed Computing** (Spark), **Git**, **Linux** (Bash)
- **Material Science:** Expert in scanning probe Microscopy (AFM, PFM, I-AFM, F-D spectroscopy), Transport Measurement, Material Characterization (SEM, XRF, XPS
- **Microfabrication:** Failure analysis, photolithography**.** microfabricated probes and circuits
- **Commercial Software:** MATLAB (signal and image processing), LabVIEW (data acquisition), COMSOL (Finite Element Modeling), Excel
- **Language:** native in Thai, and conversational Mandarin Chinese

Selected Publications

- **Memory Device:** Identified defect-dominated conduction behavior in resistive switching ZnO nanowire devices that can improve the growth process. Used non-linear fitting in MATLAB. ⬥ O. Srikimkaew, **W. Kundhikanjana (Leader),** *et al.*, Journal of Electronics material (2019)
- **Ferroelectric Material:** Studied effectiveness of Sm substitution in improving ferroelectric property, and reducing conductivity in bismuth ferrite ceramics. Identified an optimal doping level for ferroelectic device applications. Used image cross-correlation, curve fitting in python. ⬥ P. Sriboriboon, **W. Kundhikanjana (Leader),** *et al.*, Physics Letter A, (2019)
- **Biological study:** Studied survival strategy of *Arthrospira platensis (Spirulina)* by shape transformation from spiral to rod shapes for effective food production.⬥ A. Chaiyasitdhi, **W. Kundhikanjana (CO-Leader),** *et al.,* PLoS ONE, (2018)
- **Strongly Correlated Oxides:** Design, and conduct imaging experiments to capture microscopic glassy behavior of a metallic phase in a perovskite manganite film. Cross-correlation analysis to register large sets of images (MATLAB). Image segmentation to calculate areal fraction of the metallic phase. ⬥ **W. Kundhikanjana (main author)**, *et al*, Physical Review Letters, (2015)
- **Semiconductor material:** Failure analysis of a RAM device. Identify the cause of an unexpected surface implanted layer. Figure selected for cover page. ⬥ **W. Kundhikanjana (main author)**, *et al*, Semiconductor Science and Technology (2013)
- **Microfabrication:** Failure analysis to help optimize microfabrication process of cantilever probes for commercial purpose. Resulted in a spin-off company (PrimeNano Inc). ⬥ Y. Yang, **W. Kundhikanjana (co-author)**, *et al*, Journal of Micromechanics and Microengineering (2012)
- **Software:** Design automatic control and data acquisition software in LabVIEW for high-vacuum and low temperature scanning probe microscopy platform. Resulted in many follow up publication in high-impact journals. ⬥ **W. Kundhikanjana (main author)**, *et al*, Review of Scientific Instruments, (2011)
- **Hardware:** Design and implement calibration procedure for quantitative dielectric measurement with microwave microscopy technique. ⬥ K. Lai, **W. Kundhikanjana (co-author)**, *et al*, Review of Scientific Instruments, (2009)
- **Simulation:** Finite element modeling of tip-sample interaction to understand the contrast mechanism of nanoscale microwave microscopy technique, which provides hard-to-obtain information for material developments. ⬥ K. Lai, **W. Kundhikanjana (co-author)**, *et al*, Review of Scientific Instruments, (2008)