Chayut Wongkamthong

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Education

Duke University *NC, USA*

M.S. DATA SCIENCE *Aug. 2019 - May 2021*

- GPA: 3.97
- Awarded Duke Scholarship from the Social Science Research Institute (SSRI), Duke University

Chulalongkorn University *Bangkok, Thailand*

BACHELOR OF ENGINEERING *May 2011 - Jun. 2015*

- Graduated with First Class Honors and Medal of Excellence; GPA: 4.00
- Awarded Bhumibol Scholarship from HM King Rama IX

Skills and Interests

Research Areas: Bayesian statistics**,** Missing data, Statistical machine learning, Numerical optimization
Programming: Python, R, MATLAB, SQL, NoSQL, Hadoop, VBA, Basics of Java
Coursework: Bayesian Statistics, Real Analysis, Linear Algebra, Machine Learning, Statistical Modelling, Differential Equation, Multivariable Calculus, Algorithm Theories, Numerical Optimization
Data Science: Bayesian Nonparametric Models (GP, DP), ML, Deep Learning, Numerical Optimization
Certificates: **IBM** Data Science Professional Certificate, **Deeplearning.ai** Deep Learning Specialization

Experience

Social Science Research Institute (SSRI), Duke University *NC, USA*

RESEARCH ASSISTANT *Jan. 2020 - Dec. 2021*

- **Supervisor:** Olanrewaju M. Akande (SSRI and Statistical Science, Duke University)
- **Research Topics**: Bayesian nonparametric methods for missing data imputation, Dirichlet process mixture models

Electrical and Computer Engineering (ECE), Duke University *NC, USA*

RESEARCH ASSISTANT *Jan. 2020 - Dec. 2021*

- **Supervisor:** Vahid Tarokh (ECE, Duke University), Ali Pezeshki (ECE, Colorado State University)
- **Research Topics**: Radar signal processing, Statistical methods for object detection, Cluster analysis

PTT Exploration and Production Public Company Limited (PTTEP) *Bangkok, Thailand*

PETROLEUM ENGINEER *Jul. 2015 - Aug. 2019*

- **Technical Leader (Joint Ventures) with Chevron** (2018): Supervised B8/32 oil field in the Gulf of Thailand
- **Researcher** (2017): Implemented reservoir simulation (mathematical models to forecast production)
- **Reservoir Engineer** (2016): Optimized gas production in Arthit gas field (220 MMcf of gas production per day)

Projects

Hierarchical Dirichlet Process Mixture of Multinomial Distributions Model *Oct. 2020 - PRESENT*

- Develop a nonparametric Bayesian mixed membership method using hierarchical Dirichlet process prior.
- Derive its Gibbs sampling scheme; Show an application in social science in survey containing missing data.

Data-Driven Improved Radar Object Detection *Jan. 2020 - Dec. 2021*

- Developed statistical methods (Cluster analysis) for clutter representation and cancellation from radar signals.
- Developed algorithms for data-driven radar object detection and compared them with radar engineering methods.
- Collaborated with Air Force Research Laboratory; wrote the proposal for a research grant from the US Air Force.
- Wrote and published the manuscript regarding the radar clutter representation to the 2021 IEEE Radar Conference.
- Wrote and published the manuscript regarding using deep learning and computer vision techniques for target localization from radar signals to the 2022 IEEE Radar Conference.

Hierarchical Gaussian Process Model for Predicting Microbial Growth *Aug. 2020 - May 2021*

- Collaborated with the Schmid Lab, Duke; applied HGP regression for microbial growth under stress; designed GUI.

Statistical and Machine Learning Methods for Imputing Ordinal Data *Jan. 2020 - Nov. 2020*

- Analyzed missing data imputation methods (Dirichlet process mixture models, MICE) for ordinal variables.
- Performed statistical inference and evaluated distributional characteristics of imputed values.
- Wrote and published the manuscript in the Journal of Survey Statistics and Methodology (JSSAM).

Production Optimization Software: The Field State Model *Jan. 2018 - Oct. 2018*

- Innovated a software to formulate the petroleum production system into a solvable convex optimization problem.
- Cooperated with asset managers; achieved over $640,000 gain in petroleum production in 2018.
- Published the manuscript and presented it at 2018 Asia Pacific Oil and Gas Conference and Exhibition, Australia.

Slimhole Repeat Formation Tester (SRFT) Successfulness Predictor *Nov. 2017 - Jul. 2018*

- Led a team of 5; identified reservoir parameters associated with the probability of success of SRFT operation.
- Optimized classifiers (GLMs, SVM, Boosting); reduced failure rate by 30%; saved $120,000 from downtime.

Statistical Model for Reservoir Sonic Property *Oct. 2016 - Apr. 2017*

- Discovered high cost/constraints of obtaining sonic property of reservoirs, a key indicator of reservoir quality.
- Developed statistical models (GLMs, ridge regression) to infer sonic property; saved $500,000 data acquisition cost.

Conference Papers & Peer-reviewed Publications

- **Wongkamthong, C.** & Akande, O. (2021), "A Comparative Study of Imputation Methods for Multivariate Ordinal Data", Journal of Survey Statistics and Methodology. doi: smab028.
- Feng, Y., **Wongkamthong, C.**, Soltani, M., Ng, Y., Gogineni, S., Kang, B., Pezeshki, A., Calderbank, R., Rangaswamy, M. & Tarokh, V. (2021), "Knowledge-Aided Data-Driven Radar Clutter Representation", in 2021 IEEE Radar Conference (RadarConf21), pp. 1–4. doi: 10.1109/RadarConf2147009.2021.9455318.
- **Wongkamthong, C.**, Wongpattananukul, K., Suranetinai, C., Vongsinudom, V. & Ekkawong, P. (2018), "In-House Software Development for Gas Production Optimization: A South East Asia Perspective", Paper presented at the SPE Asia Pacific Oil and Gas Conference and Exhibition, Brisbane, Australia , October 2018. doi: 10.2118/192080-MS.

Manuscripts Under Review

- Venkatasubramanian, S., **Wongkamthong, C.**, Soltani, M., Kang, B., Gogineni, S., Pezeshki, A., Rangaswamy, M. & Tarokh, V. (2021), "Toward Data-Driven STAP Radar". (Accepted to the 2022 IEEE Radar Conference)

Manuscripts in Preparation

- **Wongkamthong, C.**, and Akande, O., "Imputing survey responses on political ideology using a hierarchical Dirichlet process mixture of multinomial distributions."