

Yong Ma

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Hilights

10+ years' industry R&D experiences in developing and delivering data-driven and AI/ML solutions with deep roots in signal processing, numerical optimization, HPC, and physics.

Experience

Microsoft, Applied Sciences Group

Houston, TX

Sr. Researcher

01/2024 –

Efficient AI for Edge and Cloud.

- Led developments of deep learning models for CV-related applications in oil/gas production:
 - Detect GHG emissions & associated sources (Yolo/RCNN-based) from hyperspectral images/videos,
 - Land cover classification and segmentation (UNet, GAN, Transformer) from aerial images,
 - Led a team of 5 to win the 1st place in Google Cloud Emission Hackathon in 2022.

Aramco Americas, Houston Research Center

Houston, TX

Staff Machine Learning Scientist

11/2021 – 12/2023

R&D of ML solutions for various hydrocarbon exploration, production, and upstream sustainability projects.

- Led developments of deep learning models for CV-related applications in oil/gas production:
 - Detect GHG emissions & associated sources (Yolo/RCNN-based) from hyperspectral images/videos,
 - Land cover classification and segmentation (UNet, GAN, Transformer) from aerial images,
 - Led a team of 5 to win the 1st place in Google Cloud Emission Hackathon in 2022.
- Led developments of deep learning with physics (PDE-based wave simulation) to reconstruct earth models.
 - Utilized generative models (VAE, normalizing flow) to regularize the inversion for faster convergence,
 - Built a CNN + LSTM model to infer subsurface structures and physical properties (e.g., sound speed),
 - Detected changes in subsurface from multichannel time series data via optimization.

Sinopec Tech Houston

Houston, TX

Research Advisor

04/2021 – 10/2021

Led R&D of model building and optimization for production projects in GPU cluster.

ConocoPhillips

Houston, TX

Staff/Sr. Research Scientist

11/2012 – 03/2021

Developed algorithms for machine learning and inverse problems via numerical optimization and HPC.

- Led R&D of multiple regression models with optimization methods (e.g., GD, NLCG, BFGS, L-BFGS, etc.) for solving PDE-based least-squares imaging/inversion problems with more than 10^9 parameters.
 - Designed sparse-model regression to speed up convergence by $>3X$; enabled production-size sensitivity analysis.
 - Developed advanced regularization and loss functions to reduce local minima and improve convergence landscape.
 - Optimized algorithms via MPI/OpenMP/Vectorization/CUDA for production in HPC platforms.
- Developed ML solutions and signal processing algorithms for: e.g., temporal/spatial waveform alignments via dynamic warping; frequency band expansion; acoustic signal onset time detection; denoising, etc.
- Led a team of 3-4 analysts to commercialize developed technologies & deployed models to 10+ projects.

Education

Colorado School of Mines

Golden, CO

Ph.D. in Computational Geophysics

2007 – 2012

Nanjing University

Nanjing, China

M.Sc. in Acoustics & B.Sc. in EE,

2000 – 2007