KAY SUN, PH.D.

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SUMMARY OF QUALIFICATIONS

- Experience in deep learning of medical images, data science and machine learning of medical data, data analysis and visualization, cloud data solution, computational modeling and software development.
- Proficient in Python, C++, PyData stack, Azure, Tensorflow, Keras, OpenCV.
- Success in securing grants from Department of Defense and Food & Drug Administration.

EXPERIENCE

(self-employed) ***Studio Vodels, Madison, WI | Atlanta, GA***

2019 – now ***Principal Data Scientist*** *- Independent Contractor*
- Using data analytics to understand, explain, and problem solve clinical data anomalies
- Developed machine learning models to predict patient treatment outcomes after medical therapies (scikit-learn/AutoGluon/Python)

2019 – 2022 ***Principal Deep Learning Engineer*** *- Independent Contractor*
- Developed deep learning algorithms to automate segmentation of nerves from ultrasound images for US-guided regional anesthesia (OpenCV/Keras/Tensorflow/Python)
- Developed deep learning model and framework to predict 3D dose distribution for radiation therapy planning (OpenCV/Keras/Tensorflow/Python)
- Developed a deep learning-based decision support tool for rapid analysis of fundus retina images to detect retinal abnormalities (OpenCV/Keras/Tensorflow/Python)

2021 – now ***Principal Data Architect*** *- Independent Contractor*
- Designing a web application and IoT gateway solution to connect a medical device for remote data collection (Azure/Flask/Docker)
- Designed data models, developed ETL processes, and built data warehouses and dashboards for medical data (Postgresql/AWS/Python)

HealthMyne, Madison, WI

2018 – 2019 ***Senior Scientist***
Developed and deployed machine learning models (OpenCV/Keras/Tensorflow/DL4J) to
- Classify exam groups of MR images
- Segment brain tumors in MR images and liver organs in CT images

CFD Research Corporation, Huntsville, AL

2016 – 2018 ***Principal Scientist***
2013 – 2016 ***Senior Research Scientist***
- Developed a burn injury assessment tool with morphable 3D human body models (OSG/Qt/Android | Phase I/II)
- Developed software tool to perform respirator mask sizing and predict protective fit using 2D images (OSG/Qt/C++/Android | Phase I/II)
- Developed ocular models for drug delivery simulations (FDA U01)

EDUCATION

Udacity	Nanodegree	Cloud Developer with Azure
Udacity	Nanodegree	Data Scientist
Udacity	Nanodegree	Data Engineering
Udacity	Nanodegree	Front-End Web Developer

Rice University, Houston, TX	Ph.D.	Bioengineering

- Thesis: A Finite Element Approach Towards Biomechanical Optimization of Prophylactic Vertebroplasty.

Georgia Institute of Technology, Atlanta, GA	B.Sc.	Chemical Engineering

SKILLS

Languages:	Python, C++, Unix/Linux Shell, SQL
Web Application:	HTML/CSS, Flask, Plotly
IDE:	PyCharm, Jupyter Lab, VS Code, IntelliJ
Cloud Computing:	Azure
Machine Learning:	Keras, Tensorflow, scikit-learn, AutoGluon, DL4J
Visualization Tools:	ImageJ, Meshlab, Paraview, OpenCV, OpenSceneGraph
Project Management:	Asana, Jira, Confluence, Git

GRANTS AND CONTRACTS

U.S. Department of Defense, Chemical and Biological Defense
Protective Mask Sizing App
DoD SBIR 2016.1 CBD16-005 Phase I, Option, Phase II   Kay Sun (PI)

U.S. Department of Defense, Department of the Army
Burn Injury Assessment Tool with Morphable 3D Human Body Models
DoD SBIR 2015.1 A15-055 Phase I, Option, Phase II   Kay Sun (PI)

Food and Drug Administration (FDA)
An integrated multiscale-multiphysics modeling and simulation of ocular drug delivery with whole-body pharmacokinetic response.
1U01FD005219 (2014 – 2017)   Kay Sun (PI)

PUBLICATIONS (out of 25 total)

1. Pak, J., Chen, Z., *Sun, K.*, et.al. "Computational Modeling of Drug Transport Across the In Vitro Cornea." *Computers in Biology and Medicine,* 2018 vol 92(1); 139-146.

CONFERENCE PAPERS (out of 33 total)

1. Babier, A., Zhang, B., …, *Sun, K.*, et al. "An international validation of knowledge-based planning," *Medical Physics,* 2021, Vol. 48, p. e422.
2. Gering D., *Sun, K.*, Avery, A., et. al. "Semi-automatic Brain Tumor Segmentation by Drawing Long Axes on Multi-plane" Brainlesion: Glioma, Multiple Sclerosis, Stroke and Traumatic Brain Injuries. BrainLes 2018. Lecture Notes in Computer Science, vol 11384.
3. *Sun, K.*, Rossi, M., Zhou, X., et al. "Burn Injury Assessment Tool with Morphable 3D Human Body Models" Transactions of *MHSRS: Military Health System Research Symposium*, August 15th – 18th 2016, Orlando, FL.