Nichole Sullivan

Senior Research Engineer

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https://colee222.github.io/NFS-Adv-Sci/ | https://www.linkedin.com/in/nicholesullivan

With diverse R&D experiences, I have a wide range of wet laboratory and computer science skills, in a broad array of scientific fields. I currently specialize in identifying emerging technologies across different disciplines, bringing them together, and applying them to problems in the industry sector.

EXPERIENCE

Senior Research Engineer & Product Development (2017-present)
Intelligent Fusion Technology, Inc. Germantown, MD

Intelligent Fusion technology, Inc (IFT) is a small, high-tech, R&D and engineering company that produces products across the industry sectors.

- This is a dynamic environment in which I perform continually changing duties including; grant writing, multimedia management, web-site design, public speaking, and company promoting.
- R&D areas include sensor and multi-INT fusion, situational awareness, AI/machine learning, computer vision, natural language processing, and digital engineering/digital twin development.
- Developed product lines including image processing & pattern recognition, RF situational awareness, space and terrestrial communication and network technology, and unstructured data for actionable intelligence.
- Modified and developed from scratch Digital Twins and generated sensor dataset for Condition Based Predictive Maintenance (CBPM).

Chief Operating Officer (COO) & Research Engineer (2015-2017)
G-Technology Group, LLC Alexandria, VA

G-Technology Group is the producer of Sonar Glasses, a new mobility assistive product for the blind and visually impaired, and provides secure private servers.

- Leader of Sonar Glasses product development. New developments were based on customer feedback and my relationship developed with the blind community.
- As COO of the company skills were developed to manage widely different personality types.
- Performed customer and public relations including; TV appearances, podcast and Tech Talk interviews, and customer service.
- Managed CentosOS company server and in-house applications, including Courier Mail Server.

Research Engineer & Business Development (2014-2015)
N5 Sensors, Inc. Rockville, MD

At the time of employment N5 was a 5-employee start-up company commercializing chip-scale gas sensors technology for industrial, environmental, and safety monitoring.

- Wrote and significantly contributed to many honorary and funding awards.
- Looked for strategic partnerships and investments to develop field-deployable systems for key applications and markets.
- Worked closely with N5's manufacturing team to identify device design issues, failure issues, and suggest changes in the sensor design/fabrication process.
- Leader and architect of the testing facility which included experimental testing, designed the metal/metal-oxide functionalization, data analysis, prototype design, and scientific writing.

AT A GLANCE

21 Publications
3 Patents
13 Years Experience

KEYWORDS

Chemistry – Characterization, Surface Science, Molecular Modeling
Computer Science - Artificial Intelligence, Machine Learning, Computer Vision, Natural Language Processing, Digital Twin
Web Development - Webmaster, Data Visualization, User Interface, Mobile App

ANALYTICAL & MATERIALS CHARACTERIZATION

FTIR, RAIRS, Planar & Waveguide Raman spectroscopy, SERS, ellipsometry, QCM, XPS, AES, AFM, optical profilometry, SEM, contact angle goniometer, GISAXS

PHYSICAL MODELING

Mathematica, Fortran, Quantum Espresso, VASP, Gaussian, Jaguar, COMSOL, Arduino, LabView, MATLAB Simscape, Simulink, C-MAPSS

Design: Nichole Sullivan

EDUCATION

Pennsylvania State University, University Park, PA
Ph.D. Candidate (2014) all but dissertation
Advisor: David Allara
Thesis topic: Studies of Molecular Assembly and Chemistry in Confined Geometries

Illinois State University, Bloomington, IL
B.S. Chemistry (2009) with Honors
B.S. BioChemistry (2009)
Minors: Mathematics and Biology

John A. Logan College, Carterville, IL
A.S. Degree in Chemistry (2007) Department Physical Science Award

SELECTED PUBLICATIONS

Zhao, Q., Liu, J., Sullivan, N., Chang, K., Spina, J., Blasch, E. and Chen, G., 2021, April. **Anomaly detection of unstructured big data via semantic analysis and dynamic knowledge graph construction.** In Signal Processing, Sensor/Information Fusion, and Target Recognition XXX (Vol. 11756, p. 117560N). International Society for Optics and Photonics.

Lu, J., Yu, C., Blasch, E., Ilin, R., Chen, H.M., Shen, D., Sullivan, N., Chen, G. and Kozma, R., 2021, January. **Deep learning based domain adaptation with data fusion for aerial image data analysis.** In International Conference on Pattern Recognition (pp. 118-133). Springer, Cham.

Wei, S., Tian, X., Chen, Z., Li, Y., Pham, K., Lyke, J., Foo, K., Sullivan, N. and Chen, G., 2019, May**. Toolchain based hybrid implementation for GPS satellite communications with optical crosslinks.** In Sensors and Systems for Space Applications XII (Vol. 11017, p. 110170F). International Society for Optics and Photonics. In 2019 IEEE Aerospace Conference (pp. 1-9). IEEE.

Jia, B., Dong, C., Chen, Z., Chang, K.C., Sullivan, N. and Chen, G., 2018, July. **Pattern Discovery and Anomaly Detection via Knowledge Graph.** In 2018 21st International Conference on Information Fusion (FUSION) (pp. 2392-2399). IEEE.

Cabarcos, O.M., Schuster, S., Hehn, I., Zhang, P.P., Maitani, M.M., Sullivan, N., Giguère, J.B., Morin, J.F., Weiss, P.S., Zojer, E. and Zharnikov, M., 2017. **Effects of embedded dipole layers on electrostatic properties of alkanethiolate self-assembled monolayers.** The Journal of Physical Chemistry C, 121(29), pp.15815-15830.

PATENTS

Method and System for Wave Propagation Prediction
Publication number: 20210134046

Method and System for Energy Efficient Wireless Communications
Patent number: 10798651

Method and system for pattern discovery and real-time anomaly detection based on knowledge graph
Patent number: 10679007

LANGUAGES

Python - Django
JavaScript - nodejs, react
PHP - Laravel
Templating - Mustache, Handlebars
git - GitHub, GitLab
SQL - MYSQL
HTML/CSS
ElasticSearch Kibana
Vega

WEB DEVELOPMENT

AAUW Book Club Remote Discussion -
https://colee222.pythonanywhere.com/

Story Time - A way to Pass the Pandemic -
https://nfsulli.pythonanywhere.com/

Intelligent Fusion Technology - Company Website
https://i-fusion-i.com/

ABOUT

The logo was inspired in 2019, on my 900-mile hike on the Appalachian Trail with my Adventure Mutt, Atticus. I wanted to capture my love of hands-on chemistry with the inspiration I regularly draw from nature.

I'm a trail wandering tech nerd with too many hobbies. I especially like working with my hands to build things and problem solving in games.

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