Scott P. White

Data Scientist, Chemical Engineer, Entrepreneur
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Overview:

Chemical Engineering Ph.D., Start-Up Founder, and burgeoning Data Scientist. Extensive experience (~6 years) programming custom test scripts and analyzing the large, complex data sets that result in the context of analytical chemistry (Python, R, MATLAB). Successfully led a data-intensive engineering project from inception (Academia) to commercial implementation (Start-up). Very motivated to learn and expand my interdisciplinary background for the duration of my career.

Education

University of Minnesota – Twin Cities — Minneapolis, MN
Ph.D. in Chemical Engineering, NSF Fellow (GPA: 3.8) — Dec 2017
Thesis: *"Label-Free, Microfluidic Biosensors with Printed, Floating-Gate Transistors"*
Advisors: Prof. C. Daniel Frisbie and Prof. Kevin D. Dorfman

University of Iowa — Iowa City, IA
B.S.E. in Chemical Engineering, Highest Honors (GPA: 4.0) — May 2012
Thesis: *"Microstructured Photopolymers for Directed Spiral Ganglion Neurite Growth"*
Advisor: Prof. C. Allan Guymon

Select Awards

National Science Foundation I-Corps Entrepreneurial Lead	July. 2017 – Sep. 2017
National Science Foundation Graduate Research Fellowship	Aug. 2013 – Aug. 2016
Best Oral Presentation at MRS – Organic Bioelectronic	November 2015
UMN College of Science and Engineering Fellowship	Aug. 2012 – Aug. 2013
Student Speaker at 2012 University of Iowa Engineering Graduation	May 2012
Tau Beta Pi Dept. of Chemical Engineering Outstanding Senior	May 2012

Entrepreneurship

Printed Bioelectronic Solutions (UMN Tech Start-up) — Minneapolis, MN
Founder — Fall 2016 – Spring 2018

- Developed an electronic biosensing technology from a laboratory platform to an attractive prototype for adoption into regulated analytical protocols in food safety.
- Executed an intellectual property search to protect the technology and partnered with lawyers to draft the patent and identify the key differentiators from >40 IP samples.
- Completed the National Science Foundation's I-Corps program as an Entrepreneurial Lead by implementing LEAN startup fundamentals and market discovery procedures.
- Utilized data story-telling to gain customer insights (>100 interviews), recruit support from veteran entrepreneurs, and earn credibility with industrial partners.
- Led the project from inception to implementation as an entrepreneur. Successfully transitioned the technology from academia to the commercial space in <2 years.

Experience

Insight Data Science — Remote Session
Data Science Fellow with *Insight Data Science* — Fall 2018

- Built an application, *Prescription Drugs: What's the Worst that Could Happen?,* to supplement health apps (e.g. WebMD) by providing likelihood estimates of adversity.
- Analyzed >20 GB of public health records to connect the profile of a user to the seriousness of their outcome by maximizing precision (~0.90) across various ML models.
  - *Utilized Scikit-Learn for Random Forest, Logistic Regression, Naive Bayes, and K-Means.*
- Provided actionable recommendations to assuage a user's irrational health concerns.

University of Minnesota – Twin Cities — Minneapolis, MN
Post-Doc and Ph.D. Student, Chemical Engineering — Aug. 2012 – Apr. 2018

Data Science

- Programmed electronic equipment to generate and implement user-friendly testing protocols and visualize the resulting data along with rudimentary analysis (LabView).
- Extracted complex signal waveforms from noise, designed and identified key signal features, and correlated markers with nano-scale properties using Python, MATLAB, R.
- Developed a website (www.scottpwhite.com) to highlight projects in Forecasting, Machine Learning, Natural Language Processing, Statistical Inference, and more.

Engineering R&D

- Invented a patented technique for electronic transduction of interfacial molecular capture by combining printed electronics with microfluidics
- Mapped operating regimes of floating gate transistors with electrolytes to connect fundamentals of semiconductor physics and electronics with biophysics
- Designed and manufactured a microfluidic circuit for efficient and facile delivery of samples to the sensor via photolithography and a plethora of cleanroom methods
- Communicated the work via publications, presentations (local and international), proposals, and mentoring of undergraduate/graduate students, and visiting scientists
- Developed expertise in Printed Electronics, Microfluidics, Polymer Processing, Data Analysis, Metrology, Biosensors, and Photolithography.

NASA Glenn Research Center — Cleveland, OH
Undergraduate Research Intern — Fall 2011

- Synthesized alumino-silicate polymers and derivatives to optimize their mechanical and thermal insulating properties over a variety of temperature ranges
- Fabricated composite aerogel and inorganic materials for integration into a novel, high temperature laser heating apparatus
- Collaborated with a team of technicians to catalog the material properties of novel composite materials for heat protection applications.

Monsanto Company — Muscatine, IA
Process Engineering Intern — Summer 2010

- Collaborated with operators to optimize a new process off-gas safety feature
- Facilitated the shut-down, turn-around, and production of selective herbicides such as acetochlor, butachlor, and glyphosate

University of Iowa — Iowa City, IA
Undergraduate Research Assistant, Chemical Engineering — Jan. 2011 – Aug. 2012

- Developed a process to control the reaction-transport phenomena of biocompatible photopolymers to create tunable surface microstructures
- Collaborated with the Otolaryngology Department to interface the designed photopolymers with genetically engineering spiral ganglion neurites to identify genetic factors related to cellular growth and agglomeration

Patent

Electrolyte-Gated Transistors for Detection of Molecules
White, S.P.; Dorfman, K.D.; Frisbie, C.D. Application No. PCT/US2015/045108 (pending)

Publications

10.) *Detection and Sourcing of Gluten with Multiple Floating Gate Transistor Biosensors.* **White, S.P.**, Frisbie, C.D., Dorfman, K.D. *ACS Sensors* 3.2 (2018): 395-402.

9.) *Interfacial Charge Contributions to Chemical Sensing by Electrolyte-Gated Transistors with Floating Gates.* Thomas, M.S., **White, S.P.**, Dorfman, K.D., Frisbie, C.D. *J. Phys. Chem. Lett.* 9.6 (2018): 1335-1339.

8.) *Rapid, Selective, Label-Free Aptameric Capture and Detection of Ricin in Potable Liquids using a Printed Floating Gate Transistor.* **White, S.P.**, Sreevatsan, S., Dorfman, K.D., and Frisbie, C.D. *ACS Sensors* 1.10 (2016): 1213-1216. ***ACS Author's Choice***

7.) *Operating and Sensing Mechanism of Electrolyte-Gated Transistors with Floating Gates: Building a Platform for Amplified Biodetection.* **White, S.P.**, Dorfman, K.D., and Frisbie, C.D. *J. Phys. Chem C.* 120.1 (2016): 108-117.

6.) *Synergistic Increase in Ionic Conductivity and Modulus of Triblock Copolymer Ion Gels.* Tang, B., **White, S.P.**, Frisbie, C.D., and Lodge, T.P. *Macromolecules* 48.14 (2015): 4942-4950.

5.) *Label-Free DNA Sensing Platform with Low-Voltage Electrolyte-Gated Transistors.* **White, S.P.**, Dorfman, K.D., and Frisbie, C.D. *Analytical chemistry* 87.3 (2015): 1861-1866.

4.) *Neural Pathfinding on Uni-and Multidirectional Photopolymerized Micropatterns.* Tuft, B.W., Xu, L., **White, S.P.**, Seline, A. E., Erwood, A.M., Hansen, M.R., and Guymon, C.A. *ACS applied materials & interfaces* 6.14 (2014): 11265-11276.

3.) Effects of Olefin Content and Alkyl Chain Placement on Optoelectronic and Morphological
Properties in Poly(thienylene vinylenes).
Speros, J.C., Martinez, H., Paulsen, B.D., **White, S.P.**, Bonifas, A.D., Goff, P.C., Frisbie, C.D., and Hillmyer, M.A. *Macromolecules* 46.13 (2013): 5184-5194.

2.) *Photopolymerized Microfeatures for Directed Spiral Ganglion Neurite and Schwann Cell Growth.*
Tuft, B.W., Li, S., Xu, L., Clarke, J.C., **White, S.P.**, Guymon, B.A., Perez, K.X., Hansen, M.R., and Guymon, C.A. *Biomaterials* 34.1 (2013): 42-54.

1.) *An ADMET Route to Low-Band-Gap Poly(3-hexadecylthienylene vinylene): a Systematic Study of Molecular Weight on Photovoltaic Performance.*
Speros, J.C., Paulsen, B.D., **White, S.P.**, Wu, Y., Jackson, E.A., Slowinski, B.S., Frisbie, C.D., and Hillmyer, M.A. *Macromolecules* 45.5 (2012): 2190-2199.

Presentations

7.) **White, S.P.**, Dorfman, K.D., Frisbie, C.D., "Food Sensors with Printed, Floating-Gate Transistors." *North American Chemical Residue Workshop (NACRW)*, Summer 2018, Naples, FL

6.) **White, S.P.**, Thomas, M., Dorfman, K.D., Frisbie, C.D., "Biosensors Utilizing Printed Floating Gate Transistors (FGTs) and Microfluidics." *IPRIME Annual Meeting*, Spring 2017, Minneapolis, MN

5.) **White, S.P.**, Sreevatsan, S., Dorfman, K.D., Frisbie, C.D., "Rapid Quantitation of Toxic Protein Levels by Combining Printed Electronics and Microfluidics." *AIChE Annual Meeting: Biosensor Devices: Platforms and Techniques.* Fall 2016, San Francisco, CA.

4.) **White, S.P.**, K.D. Dorfman, C.D. Frisbie, "Operating Mechanism of Biosensors Utilizing Floating-Gate Transistors and Electrolyte Dielectrics." *MRS Biannual Meeting: Organic Bioelectronics – From Biosensing Platforms to Implantable Nanodevices*. Fall 2015, Boston, MA

3.) **White, S.P.**, K.D. Dorfman, C.D. Frisbie, "Biosensing Mechanism of Floating-Gate Transistors Utilizing Electrolyte Dielectrics." *AIChE Annual Meeting: Biosensor Devices: Platforms and Techniques.* Fall 2015, Salt Lake City, UT

2.) **White, S.P.**, K.D. Dorfman, C.D. Frisbie, "Label-Free Biosensing with Printed, Low-Voltage Electrolyte-Gated Transistors" *IPRIME Annual Meeting*, Spring 2015, Minneapolis, MN

1.) **White, S.P.**, K.D. Dorfman, C.D. Frisbie, “Printed, Electrolyte-Gated Transistors as Label-Free Biosensors.” *AIChE Annual Meeeting: Biosensor Devices: Platforms and Techniques*. Fall 2014, Atlanta, GA

Teaching Experience

University of Minnesota – Twin Cities — Minneapolis, MN
Ph.D. Student, Chemical Engineering — August 2012 – May 2017

- Teaching Assistant
  - Diffusion, Junior Chemical Engineers
  - Reactor Design, Junior Chemical Engineers
  - Unit Operations Laboratory, Junior Chemical Engineers
- Research Experience for Undergraduates (REU) Mentor
  - Four students total from a variety of demographic, scholastic, and geographic backgrounds

University of Iowa — Iowa City, IA
Undergraduate Engineering Student — Spring 2010 – Spring 2012

- Teaching Assistant
  - Chemical Process Design, Senior Chemical Engineers
  - Chemical Process Safety, Junior Chemical Engineers
  - Process Calculations, Sophomore Chemical Engineers
  - Engineering Flow and Heat Exchange, Sophomore Chemical Engineers