

# Jack Hartsell

Math Instructor, Analyst, Full-Stack Python Developer

## CONTACT INFO

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## EDUCATION

### East Tennessee State University

2016 TO 2018

#### Master of Science, Mathematical Sciences

Thesis: A Normal Form for Words in the Temperley-Lieb Algebra and the Artin Braid Group on Three Strands.

Successfully defended on October 31st, 2018.

Advisor: Dr. Frederick Norwood

Committee Members: Dr. Robert Gardner, Dr. Rodney Keaton

External Examiner: Dr. Donald Good

Member of Kappa Mu Epsilon Honor Society

GPA: 3.67

Courses taken include:

- Predictive Analytics
- Real Analysis
- Graph Theory
- Modern Algebra
- Topology
- Knot Theory

### East Tennessee State University

2009 TO 2013

#### Bachelor of Science, Physics

Major in Physics

Minor in Mathematics

Courses Taken include:

- Linear Algebra
- Calculus I and II
- Math Reasoning
- Introduction to Modern Algebra
- Intro to Probability and Statistics, calculus based
- Technical Physics I and II
- Computational Physics
- Kinetic and Statistical Physics
- Classical Mechanics
- Optics
- Electricity and Magnetism
- Quantum Mechanics

## EXPERIENCE

### Nurturing Wisdom

JANUARY 2019 TO PRESENT

#### Tutor

- Tutoring high school students in mathematics, geometry, and test prep for SAT and ACT.
- Responsible for providing support as a mentor and coach for executive functioning skills.

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## **East Tennessee State University**

### **Instructor**

JULY 2017 TO AUGUST 2017,  
AUGUST 2018 TO DECEMBER  
2018

- Served as an instructor for two terms teaching Precalculus II and Trigonometry.
- Served as a teaching assistant to Assistant Professor Jamie McGill for an accelerated Precalculus I and II term, providing supplementary instruction to students and creating educational materials.

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## **ETSU, Center for Academic Achievement**

### **Math Tutor**

AUGUST 2016 TO MAY 2017

- Assisted and instructed students in a variety of subjects including probability and statistics, linear algebra, and calculus.
- Provided remedial instruction in High School Mathematics.

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## **Matt's Tech Shop**

### **Technician and Customer Support**

NOVEMBER 2015 - FEBRUARY  
2016

- Provided customer support regarding technical issues, both over the phone and in-store, with or without presence of the device.
- Issues included malfunctioning hardware or software, misconfiguration, and malware on Windows and Apple computers, as well as Android and Apple handheld devices, and various models of televisions and console gaming systems.
- Provided followup consultation to customers regarding scope and nature of technical issues, outlined steps to be taken to prevent them in the future.
- Updated and maintained SQL database of customer work orders to reflect current status, completion, order dates for parts required, and dates of important communications with the customers.

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## **Nightech**

### **SEO Consultant**

AUGUST 2014 TO OCTOBER  
2014

- Completed the first phase of an on-page search engine optimization project with Nightech for their website at metasaver.com, a dynamic e-commerce review aggregation site.
- Delivered positive increases in search engine rankings for several keywords, resulting in more traffic and thus more customers.
- Researched, discovered, and exploited opportunities that were missed by their competitors in search engine rankings.

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## **GB Ventures LLC**

### **Digital Marketing Consultant**

APRIL 2014 TO OCTOBER 2015

- Functioned as an SEO and online marketing consultant.
- Developed a brand presence for their flagship website via paid social media advertisements.

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## **ETSU Department of Biology**

### **Student Worker**

OCTOBER 2011 TO MAY 2012

- Constructed 3D models of paleolithic life forms using industry standard software (Maya, Blender).

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## ETSU Bureau of Business and Economic Research

SEPTEMBER 2009 TO  
OCTOBER 2011

### Student Worker

- Duties included basic clerical and administrative assistance.
- Assisted with research via data collection from academic databases and cold calling.
- Used Excel to organize and deliver data collected for various projects.

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### TECHNICAL STRENGTHS

Computer Languages	Python, Elixir, Ruby on Rails, JavaScript, Erlang, Go, C, C++, C#, Swift, Java, Fortran
Markup Languages	Latex, HTML, XML, JSON, Markdown
Software	Microsoft Office Suite, Notepad++, Github, Sublime Text, PyCharm
Platforms	Linux, MacOS, Windows Server and Desktop, iOS, Android
Other	Predictive Analytics, Supervised Machine Learning, Unsupervised Machine Learning, Neural Networks, Data Mining, SQL, MongoDB, Tableau, Docker, Vagrant, VMWare, HyperV, Parallels, VirtualBox, pfSense, openWRT, Raspberry Pi

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### PROJECTS

#### Yelp Review Useful Rating Prediction

JANUARY 2017 TO MAY 2017

- Used Python to build a predictive model of the projected influence of reviews on Yelp.
- Created inputs for the predictive model via text-mining of reviews.
- Implemented both Random Forest and Neural Networks for the predictive model, with calculations ran using NVIDIA's CUDA technology as an interface for GPU based computing.
- Used Tableau for creating presentations of the project's findings.
- Coordinated project with, and provided results to, a business liaison from Chick-Fil-A, the project's sponsor.

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#### Kaggle - Otto Group Product Classification Challenge

MAY 2015 TO MAY 2015

<https://www.kaggle.com/c/otto-group-product-classification-challenge>

- Created a neural network to better sort products into appropriate categories so that product performance could be more consistently compared with other products of the same category.
- Placed in the top 25%

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#### Kaggle - Avazu Mobile Marketing CTR Prediction

JAN 2015 TO FEB 2015

<https://www.kaggle.com/c/avazu-ctr-prediction>

- Used machine learning to predict click-through rates of mobile ads given 11 days worth of advertising data.
- Best answer submitted utilized adaptive learning rate logistic regression with L1/L2 regularization in Python.
- Experimented with alternative methods utilizing the Scikit-learn, Pandas, and Numpy libraries.
- Also experimented with using SQL and MongoDB databases instead of the raw .csv file provided.

## PRESENTATIONS

### **Departmental Presentation - Analyzing and Predicting Influence of Yelp Reviews**

How text mining can be used to extract inputs for a predictive model capable of forecasting the influence of reviews of restaurants on Yelp.com, and what we were able to discover that was relevant to business decisions that influence the quality of service and customer experience.

## REFERENCES

### **Dr. Frederick Norwood**

Professor, East Tennessee State University  
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### **Dr. Robert Gardner**

Professor, East Tennessee State University  
Department Graduate Student Coordinator  
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### **Deidre R. Johnson**

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### **Jamie W. McGill**

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### **Matthew Graybeal**

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