

# JOEL VENZKE

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## SUMMARY

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One and a half years of research experience in computational science  
Experience using supercomputing technologies such as Stampede (TACC) and Gordan (SDSC)  
Experience in data and numerical analysis  
Presented research at local, regional, and national conferences  
Quick to learn new skills, techniques, and algorithms

## EDUCATION

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### Drake University

B.S. in Computer Science, Mathematics, and Physics

Society of Physics Students Chapter President

Math Club Vice President

Physics Tutor

August 2012 - May 2016 (*expected*)

Cumulative GPA: 3.85

## RESEARCH EXPERIENCE

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### Computational Atomic Physics, Ultrafast Electronic Dynamics

*Undergraduate Researcher*      *PI: Klaus Bartschat, Ph.D.*

August 2014 - Present

*Drake University*

- Simulated ultrafast laser pulse interactions on the hydrogen atom
- Used Fortran and OpenMP to parallelize wave-function propagation
- Interfaced with XSEDE Supercomputers such as Stampede (TACC) and Gordan (SDSC)
- Performed numeric testing and data analysis

### Computational Bioinformatics, Automating NRM Assignment

*Undergraduate Researcher*      *PI: Timothy Urness, Ph.D.*

September 2013 - Present

*Drake University*

- Automated the assignment of error prone nontrivial NMR datasets
- Implemented Artificial Intelligence based algorithms in Python
- Interfaced with machine learning software
- Worked with Unit testing software

### American Mathematical Society (AMS), Sage Math

*Undergraduate Researcher*      *PI: Jason Grout, Ph.D.*

September 2013 - May 2014

*Drake University*

- Developed open source math software
- Trained new developers on code base
- Developed pythreejs, a Python/three.js bridge for web-based graphics

### Signal and Image Analysis, MCTP Pre-REU

*Undergraduate Researcher*      *PI: Gregory Berkolaiko, Ph.D.*

June 2013 - July 2013

*Texas A&M University*

- Developed fraud protection software
- Implemented signature analysis algorithms in MatLab
- Applied Fourier Analysis and Wavelet Decomposition to analyze signatures
- Tested algorithms performance against a signature database

## ADDITIONAL EXPERIENCE

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### The Times-Delphic

*Photo Editor/Staff Photographer*

September 2012 - Present

*Des Moines, IA*

- Trained and managed staff photographers
- Produced quality work within strict deadlines
- Photographed major events and stories such as Drake Relays

## TECHNICAL STRENGTHS

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<b>Languages</b>	Python, C/C++, Java, Fortran, Bash Scripting
<b>Parallel Computing</b>	CUDA, OpenMP
<b>Software Skills</b>	Vim, Sublime Text, Git, Gnuplot, L <sup>A</sup> T <sub>E</sub> X, Command Line, ssh/sftp
<b>Operating Systems</b>	Mac OSX, Linux, Windows 7
<b>Specialties</b>	Parallel Computing, Artificial Intelligence, Data Analysis

## RESEARCH PRESENTATIONS AND PUBLICATIONS

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### Presentations

- Joel Venzke. “Pulse-Shape Effects on the Autler-Townes Doublet in Strong-Field Ionization of Atomic Hydrogen”. Tuscan, AZ, October 2014. Frontiers In Optics: 98th OSA/APS Annual Meeting (FiO 2014). Poster
- Joel Venzke. “Automated Assignment Of Backbone NMR Data with A\*”. Verona, Wisconsin, April 2013. Midwest Instruction and Computing Symposium (MICS). Talk
- Joel Venzke “Automated Assignment Of Backbone NMR Data with A\*”. Des Moines, Iowa, April 2013. Drake University Conference on Undergraduate Research in the Sciences (DUCERS). Talk
- Joel Venzke “Signature Authentication Using Wavelets and Fourier Analysis”. College Station, Texas, July 2013. Mentoring through Critical Transition Points Symposium (MCTP). Talk

### Conference Publications

- Joel Venzke. “Automated Assignment Of Backbone NMR Data with A\*”. Verona, Wisconsin, April 2013. Midwest Instruction and Computing Symposium (MICS).

## HONORS/AWARDS

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<b>Drake University Presidents List</b>	Spring 2014
<b>Drake University Top Sophomore</b>	Spring 2014
<b>Drake University Deans List</b>	Fall 2012 - Fall 2013
<b>Drake Physics Prize Scholarship, Full Tuition</b>	Spring 2012
<b>Drake University Presidential Scholarship</b>	Spring 2012
<b>Boy Scouts of America Eagle Scout Award</b>	Spring 2012