Alex Atanasov
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EDUCATION

Yale University — Graduation: May 2018 (expected)
B.S. Physics, M.S./B.S. Mathematics
Overall GPA: 3.92/4.0
- **Relevant Undergraduate Coursework**: Modern Combinatorics, Design & Analysis of Algorithms, Systems Programming and Computer Organization "*CS 323*"
- **Relevant Graduate Coursework**: Complex Analysis, Einstein Gravity, Statistical Mechanics, Lie Algebras & Applications, Seminars in: Representation Theory, Algebraic Geometry, Quantum and Conformal Field Theory

Thomas Jefferson High School for Science and Technology — Graduation: June 2014
Overall GPA: 4.41 weighted (corresponding to 3.92/4.0)
- **Relevant *Post-AP* Coursework**: Parallel Computing I & II, Numerical Analysis, Complex Analysis, Linear Algebra

WORK & RESEARCH EXPERIENCE

Software Engineering Intern — May – August 2017
Google Inc. — *Location TBD*

Visiting Researcher & Software Developer: Sparse Grid Discretization for Big Data — May 2016 – January 2017
Perimeter Institute for Theoretical Physics – Supervised by Dr. Eric Schnetter — *Waterloo, ON*
- One of seven students selected internationally to participate in Perimeter's undergraduate program.
- Built a Julia package (repository available here) for solving Einstein's equations on large datasets by using *sparse grids*. Sped up 2D solvers from $O(N^2)$ to $O(N \log N)$ and 3D solvers from $O(N^3)$ to $O(N \log^2 N)$, where N is the resolution.
- Writing up final paper to publish on the ArXiv with my supervisor in the coming months.
- Organized 10 weekly *undergraduate lecture seminars.* Presented two lectures on complex & algebraic geometry.
- Selected as lecturer & mentor for the high schoolers in the ISSYP program (lecture video here).

Undergraduate Researcher: Machine Learning for Emulation of Neuronal Networks — December 2015 - Present
Yale School of Medicine, Dept. of Psychiatry N3 Division– Supervised by Dr. John Murray — *New Haven, CT*
- Developed Python package to train recurrent neural networks to emulate the outputs observed in medical data, using Theano and PyCUDA on the Yale cluster, alongside tools from high-dimensional data science. *Intend to publish results.*

Multi-scale Modelling of Carbon Nanomaterials — June 2014 – January 2016
MITRE Corporation Student Program – Supervised by Dr. James Ellenbogen — *McLean, VA*
- Used classical electrostatics, and graph theory to account for trends in the capacitance of carbon nanomaterials.
- Final paper of results recently submitted to Physical Review A.

SEAP Program Selected Student: Plasma Cloud Generation using Cavity Resonators — May – August 2013
Naval Research Laboratory – Supervised by Dr. Paul Bernhardt — *Washington D.C.*

LARGE PROJECTS & PUBLICATIONS

Kaggle: Predicting Epileptic Seizures — September 2016, Ongoing
- Working in a group of four on using machine learning to recognize signs of epileptic seizures in human subjects.

Theoretical & Applied Neural Computing (ThinkTANC@Yale) — September 2016, Ongoing
- Founder and President of student group for hosting speakers and working to build machine learning initiatives at Yale.

Representations of a Physical Universe — May – November 2016 (expected release)
- Extracurricular collaboration with a friend to write an 'open textbook' here on the ideas of modern mathematical physics.

GalerkinSparseGrids.jl — May – August 2016
- Software for avoiding the curse of dimensionality when numerically solving differential equations in high dimensions.

Complex Analysis: In Dialogue — May – October 2013
- Independently published a 500-page pedagogical work on complex analysis in high school. Made for-sale on Amazon.

HONORS AND AWARDS

- **William L. Putnam Mathematics Competition** – Top 300 (taken once so far) — 2016
- **Morse College Richter Fellow** & **Yale Dean's Research Fellow** — 2016
- **United States Physics Olympiad Semifinalist** — 2013

SKILLS

Programming:	C, Julia, Python, Mathematica, Java, Matlab/Octave, HTML/CSS, Excel, R *(by experience, most to least)*
Parallel tools:	OpenMP, MPI, CUDA, PyCUDA @ Theano/Tensorflow. Strong background in scientific computing and HPC.
Languages:	English, Bulgarian (native speaker, can read, & write), Latin (read & write, AP and graduate coursework)
Other:	Strong background in tutoring, public speaking, and academic lecturing. Last but not least, user of LaTeX.