Alex Atanasov
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EDUCATION

Yale University   Graduation: May 2018
B.S. Physics, M.S./B.S. Mathematics
Overall GPA: 3.93/4.0
- **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: Machine Learning for Google Android   May – August 2017
Google   *Mountain View, CA*

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.
- 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).
- Currently writing up final paper to publish results.

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 quantum theory to account for trends in the capacitance of carbon nanomaterials.

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

Analytic Formulas for Detachment Energies in Carbon Fullerenes   March, 2017
- Paper published in Physical Review A, in collaboration with Dr. James Ellenbogen. (link)

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

Representations of a Physical Universe   May 2016, Ongoing
- Extracurricular collaboration with a friend to write an 'open textbook' here on the ideas of modern mathematical physics.

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

Complex Analysis: In Dialogue   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 @ Tensorflow/Theano. 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 $\LaTeX$.