Andrei**Tumbar**

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Programming Languages
C, Python, C++,
x86, Arm,
Cython,Verilog,
VHDL, Java,
JavaScript,
CSS, HTML, Typescript
AJAX, LaTeX

Technologies
FPrime, Linux, cgroups,
AddressSanitizer,
FreeRTOS,
namespacing, socket,
Fuzzing, AFL,
SSL, libarchive,
CUDA, LLVM IR,
PostgreSQL, Django,
Google API,
Amazon AWS EC2,
CPython, libclang

Work Experience

Aug-2020 Apr-2022 **Jet Propulsion Laboratory - NASA**   Remote
Robotics Engineering Intern
Worked full time as a developer for the Mars-2020 project (Perseverance). Worked on SSim, a simulation program for modeling Mars-2020 rover flight software for rover planners to test their command sequences before instructing the real rover on Mars. Also worked on a new lunar arm mission planned for 2023 launch: COLDArm. Made the JPL's flight-software development framework, FPrime, usable as a simulation platform for deterministic development and mission operation planning.

2018, 2019 **Cornell University**   Ithaca, New York
Programmer
Two summers working to implement statistical models in Mathematica and Python. Wrote front end to statistical modeling algorithms for research (letter of recommendation available upon request).

Jun-2019 **Treman State Park**   Ithaca, New York
Maintainance
Maintained state park facilities. Work included cleaning bathrooms, planting trees, clearing trails, and general maintenance. Worked independently for the majority of the day while also in charge of one other worker.

Education

2019−now **BS candidate** in Computer Engineering (3.96/4.00 GPA) − May 2023

- **Embedded and Realtime Systems**
- **Calculus I-IV, Uni-Phys I-II**
- **Linear Algebra & Boundary Value+Diffeq & Complex Variables**
- **Interface to Digital Electronics**

Rochester Institute of Technology

Projects

Spring 2022 **Raspberry Pi Autonomous Vehicle**   https://github.com/Kronos3/vo-cmpe460
Class project used a simple line-scan camera to control small battery powered car around a race track. This project is an extension of the class project in which a Raspberry Pi will use a 2D camera and apply vision processing to image frames for edge detection of track lines. Software is built on top of the FPrime Flight-Software framework.

2021-now **Neoast**   https://github.com/AutoGentoo/neoast
Modern compiler-compiler written to generate LALR(1) and CLR(1) parsing tables as well as a full lexer/parser combination. The purpose of this is to replace old and bloated implementations such as Bison and Flex and utilizes compiler-time FSM generation for regular expressions during lexing as well as a re-entrant design during parsing.

Summer 2020 **Phase Electron Microscope**   Closed-source
Object-oriented approach to controlling various devices in data acquisition for a phase electron microscope. Designed so that any devices can be easily swapped out with very view changes to the overall system. Learned about programming hardware and performing image processing through GPU programming. Also learned how to program DAC on FPGA to control galvo mirrors controlling laser direction.

2014-now	**AutoGentoo**	https://github.com/AutoGentoo/AutoGentoo

A scalable Linux environment manager for creating optimized Gentoo Linux environments. Designed to bring higher performance to any platform at low maintenance cost.

2019-now	**CPortage**	https://github.com/AutoGentoo/cportage

A highly optimized rewrite of the Gentoo package manager. Written in C, CPortage is able to complete I/O, the most taxing phase of a package manager's calculations in less then a tenth of a second. Gentoo's custom language standards (ebuild) was rewritten in the Bison/Flex grammar parser.

General Interests

Linux and Open-Source
Love open-source and its development. Linux, being free, open-source and very customizable, has become a hobby of mine.

C
Advanced use of C and many of the POSIX technologies. Wrote networking, thread schedulers, grammar parsers, advanced data structures, tree recursion and more. Around 3+ years of experience.

Python
Python is a great tool for writing I/O scripts and complex string parsers. Also works well for front-end GUI design. Around 6+ years of experience.

Skills

Time Management skills
Able to keep up with full-time work at NASA as well as full-time student at RIT.

Programming Ability
Advanced programming skills in C and Python. Profficient in Java and C++.

Quick Learning Capability
Able to learn new APIs and programming languages with ease.

Teamwork Skills
Competed in Engineering and Computer Science competitions at the national level very successfully in multiple teams.