# Alexander Ionkov

Madison, Wisconsin, United States ionkov@wisc.edu (505) 500-6380 https://www.linkedin.com/in/aionkov/ https://ionkov.tech

## EDUCATION

**Bachelor of Science in Computer Science**
University of Wisconsin Madison • Madison, WI • Anticipated graduation in December 2021

## SUMMARY

Alexander Ionkov is a third year student in Computer Science at the University of Wisconsin Madison. His interests include software engineering, computer graphics, augmented and virtual reality (AR/VR), and user interface/user experience (UI/UX). In the past, he worked at Kodi for the Google Summer of Code, writing a web interface in Elm and Javascript, on an online experiment container in Flask, Javascript, and MySQL for the UW Graphics Group, on RNA sequencing projects at the Morgridge Institute for Research under John Steill and Matthew Bernstein, and at the Los Alamos National Laboratory on parameter fitting optimizations for cell signaling models under William Hlavacek and Ryan Suderman.

## EXPERIENCE

### Student Developer
**Google Summer of Code @ Kodi** **May 2020 - August 2020, Remote**
• Developed new web interface SPA in Elm and Javascript for the Kodi (XBMC) media library which has 38 million users.
• Elm-chorus supports live playback and organization of media over web sockets using the JSON-RPC API.

### Undergraduate Intern
**UW Graphics Group** **June 2020 - August 2020, Madison, WI**
• Created a new online experiment container for Amazon MTurk using jsPsych, Flask, and MySQL.

### Software Engineer Intern
**Morgridge Institute for Research** **March 2019 - March 2020, Madison, WI**
• Implemented scraping script to obtain data using NCBI E-Utils API.
• Coded in Python for a pipeline for measuring abundance of proteins in RNA-Seq reads.
• Led initiative to replace project testing framework from Unittest to Pytest.

### High School Intern
**Los Alamos National Laboratory** **May 2017 - August 2018, Los Alamos, NM**
• Collaborated in a three-person team that shipped an application for fitting models to experimental data in C++ and in Python.
• Wrote parts of custom syntax parser in Python for BNGL language.
• Created graphical user interface for PyBioNetFit in PyQt 5.

## PROJECTS

### Custom Augmented Reality Headset
Meant to provide an accessible alternative to VR/AR headsets

• Created prototype for 3D printed augmented reality headset for use with iPhones and smartphones
• Implemented webcam hand tracking using Google Mediapipe Handpose AI model and Three.js
• Purely in the web browser using Javascript

### elm-chorus
Google Summer of Code @ Kodi • Summer 2020

• Rewrote web interface for Kodi in Elm; 10k LOC Elm SPA.
• wrote JSONRPC decoders, and a partial wrapper.
• designed media library/player UI, utilized localStorage.

### RigMe - Custom Avatar Generation AI pipeline
Designed for use with virtual and augmented reality applications

• Developed pipeline of open source AI models in Python
• Takes 2D body image as input and outputs generated rigged 3D model with armature (avatar)
• Generated avatars can be animated and controlled in Maya, Unity, Exokit

### posenetToThreejs
August 2020

• Uses Google Mediapipe PoseNet AI model to find body poses with webcam.
• Sends keypoint data over websockets (SocketIO) to Three.js client.
• Three.js client maps pose data to humanoid model.

## PUBLICATIONS

• Hlavacek, W. S., Csicsery-Ronay, J. A., Baker, L. R., Álamo, M. D. C. R., **Ionkov, A.**, Mitra, E. D., ... & Thomas, B. R. (2019). A step- by-step guide to using BioNetFit. In Modeling Biomolecular Site Dynamics (pp. 391-419). Humana Press, New York, NY.
• Mitra ED, Suderman R, Colvin J, **Ionkov A**, Hu A, Sauro HM, Posner RG, Hlavacek WS (2019) PyBioNetFit and the Biological Property Specification Language. iScience 19: 1012-1036.
• Mitra, E., Suderman, R., **Ionkov, A.**, Hlavacek, W., & National Institutes of Health. (2018). PyBioNetFit. Los Alamos National Lab.(LANL), Los Alamos, NM (United States).

## SKILLS

**Python, Java, C, Javascript, Elm, Three.js, HTML, CSS, Node.js, Electron, Pytest, Flask, Firebase, Elm-UI, Bash, Git, Solidworks, Maya, Rhino, Unity**