

# Kaitlin A Clark

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## HIGHLIGHTS OF QUALIFICATIONS

- Four years of outstanding research and information management capabilities.
- Capable of quickly understanding how systems are used in order to provide efficient support.
- Excellent communication skills both verbally and written with good interpersonal skills.
- Proven ability to build and debug applications of both low- and high-level programming languages.
- Detail oriented, strong organizational skills with ability to carry out tasks with minimal supervision.

## THEORETICAL AND PRACTICAL KNOWLEDGE

❖ Data Structures	❖ Asymmetric Cryptography	❖ Finite State Machines
❖ Automata Theory	❖ Bioinformatics	❖ Recursion
❖ Greedy Algorithms	❖ Dynamic Programming	❖ Symmetric Cryptography
❖ Hidden Markov Models	❖ Chalk/Poster/Verbal Presentations	❖ Biological Data Analysis

## EDUCATION

Washington University in St. Louis (WUSTL)  
*Candidate for Bachelor of Science, May 2020*

Major: Computer Science  
Honors:

Minor: Bioinformatics

GPA: 3.03

- 2017 Ralph Bunche Scholar Award Recipient
- 2018-2020 MARC U-STAR Scholar

## RESEARCH EXPERIENCE

Department of Computer Science | Princeton University

**Research Assistant**

*Summer 2019*

- Engineered an algorithm under the mentorship of Dr. Benjamin Raphael to automate the accurate inference of copy-number variants based on simulated sequence reads and B-allele frequencies (BAFs).
- Generated randomized gene sequencing reads simulating tumor with copy-number variants (CNVs) based on a statistical model with preset canonical parameters.
- Analyzed the accuracy and precision of simulated sequencing data using Hidden Markov Models and Viterbi algorithm, which utilizes maximum likelihood estimation to infer copy-number of a chromosomal region given an observed read-depth or BAF.

### Languages:

Java, C++, Python,  
HTML/CSS, Arduino C,  
PHP, JavaScript, Angular,  
SocketIO, NodeJS,  
Mathematica (Wolfram  
Language), Swift, Spanish  
(intermediate), French  
(elementary)

### Technologies:

Apache, Git, Bash,  
Command Line,  
Linux/Unix, Visual Studio,  
GitHub, MySQL, Bit  
Bucket, Amazon EC2,  
VirtualBox, SEED Labs for  
Ubuntu 16.04, Xcode IDE

### Related coursework:

Analysis of Algorithms,  
Introduction to Computer  
Security, Data Structures  
and Algorithms, Object  
Oriented Design with C++,  
Introduction to Computer  
Science, Rapid Prototyping  
Development, Logic and  
Discrete Mathematics,  
Matrix Algebra, Calculus I,  
II, III, Algorithms for  
Computational Biology,  
Principles of Biology II,  
Principles of Biology I

- Presented 10-minute PowerPoint on inference of copy-number aberrations using HMMs at 2019 Leadership Alliance National Symposium.

## McDonnell Genome Institute | Washington University School of Medicine (WUSM)

### **Curator**

*February 2017 – December 2018*

- Submit background data on variants discovered to be influential in carcinogenesis, the progression of cancer, metastasis, or sensitivity to clinical treatments.
- Name protein variants, coding DNA variants, and reference DNA loci for the Clinical Interpretation of Variants in Cancer (CIViC) project.
- Designed Python scripts to analyze genotype-phenotype associations for highly curated variants using the CIViC API.
- Assembled information about VHL variants and von-Hippel Lindau disease phenotypes to discover novel associations among the common phenotypes and genotypes.
- Presented several 10-15-minute posters and PowerPoints on the integration of the VHL dataset into the CIViC site.

## Summer Engineering Fellowship Program | WUSTL

### **Research Assistant**

*Summer 2018*

- Conducted research under the mentorship of Dr. Michael Brent to customize and automate the integration of human gene expression data into an algorithm (NetProphet 2.0) used to map transcription factor networks in Drosophila and yeast.
- Presented a 10-minute PowerPoint presentation on reformatting human gene expression data and utilizing online resources like Genotype-Tissue Expression (GTEx) datasets, GeneHancer data, and the NCBI Conserved Domain Search for input into the NetProphet 2.0 algorithm.

## OGR Undergraduate Scholars Summer Program | WUSM

### **Research Assistant**

*Summer 2017*

- Conducted research in a computer-based lab to manage or organize the development of a database of variants in VHL gene, which plays a central role in Von Hippel Lindau disease.
- Presented a 15-minute PowerPoint presentation at the program closing symposium on the genotypic and phenotypic data curated for 500 VHL variants from over 150 publications.

## U-STAR Summer Scholars Program | WUSTL

### **Research Assistant**

*Summer 2017*

- Synthesized information in over 100 publications about the development and manifestations of von Hippel Lindau disease.
- Presented a 10-minute PowerPoint presentation at the program closing symposium and a poster presentation at the Fall 2017 Undergraduate Research Symposium hosted at Washington University in St. Louis.

## **VOLUNTEER EXPERIENCE**

### Medi-Plex Hospice | St. Louis, MO

#### **Volunteer**

*February 2017 – February 2018*

- Counseled 2 terminal disease patients twice a month to help them and their families cope with and prepare for the loss of a loved one.

### Global Brigades | El Zarzel, Honduras

#### **Volunteer**

*March 2017*

- Assisted several physicians, dentists, pharmacists on recording patient health info for over 600 local community members.
- Instructed 100 local children on dental and personal hygiene using musical aides, worksheets, and open discussions.

## WORK EXPERIENCE

Department of Computer Science | Washington University School of Engineering

### ***Teaching Assistant***

*January 2017 – Present*

- Presented and explained material to students in Introduction to Computer Science I (CSE 131), Data Structures and Algorithms (CSE 247), Rapid Prototype Development (CSE 330), and Algorithms for Computational Biology (CSE 587A).
- Worked with a team of teaching assistants to run office hours to help students debug, troubleshoot, and figure out their codes and problem sets.
- Graded exams and evaluates the quality and completion of student's projects reinforce lessons presented by professors on basic concepts like recursion, data types, and object-oriented programming by reviewing material with students one-on-one or in small groups.
- Assisted students in debugging Java, Python, PHP, HTML/CSS, SocketIO, JavaScript, Mathematica programs.