Kevin **Dick**

PhD Biomedical Engineering Candidate · Machine Learning Specialist · Data Scientist && Bioinformatician

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"Polymath, Innovator, Adventurer..."

Experience

Agriculture Canada, Government of Canada
Ottawa, Canada

Contract Research Scientist — *September 2017 - Present*

- Contract research project to elucidate protein-protein interactions between soybean and humans relevant to human health

Dept. Natural Resources, Government of Canada
Ottawa, Canada

Contract Research Scientist — *January 2017 - April 2018*

- Three month contract research project on the application of deep learning for the identification of threats to critical infrastructure.
- **Responsibilities:** Reviewing and critically assessing the literature on computer vision; proposing innovative solutions to alleviate the resource burden on critical infrastructure; developing and implementing the proposed solution; preparing and executive-level report on the literature and proposed application.
- **Skills:** TensorFlow (trained and tested a CNN), Google API (generated a dataset population of Street View images), Image Annotation using LabelMe

Dr. Patankar Lab, IIT Bombay
Mumbai, India

Global Research Internship — *August 2016 - December 2016*

- Bioinformatic study of Malaria-causing *Plasmodium falciparum* to elucidate novel protein transport pathways of clinical therapeutic relevance.

Dr. James Green Lab, Carleton University
Ottawa, Canada

Research Assistant — *September 2015 - Present*

- Working on several machine learning projects in the field of bioinformatics for protein-protein interaction prediction.
- **Project:** Zika-Human protein-protein interaction prediction for potential drug targets.
- **Project:** Malaria parasite protein-protein interaction prediction
- **Project:** Large-scale comparison of protein sequence- and structure-based methods
- **Project:** Identification of unvaccinated individuals in Canada
- **Project:** SNP-based prediction of in human proteomes for personalized interactomes
- **Project:** Web service development for improved dataset quality
- **Project:** Deep learning models for tongue classification in speech therapy

Revision Military
Ottawa, Canada

Test and Trials Specialist — *June 2014 - June 2015*

- Responsible for designing and programming the interactive interface of intelligent battery systems, communicating between the end-user and the engineering team, and ensuring human factors compliance with established military standards.
- Developed a virtual tablet application to engage end-users and acquire feedback.
- Designed and prototyped cables to intelligently interface with existing military devices.
- Developed embedded software validation routines and firmware update applications.

Dr. Murgita Lab, McGill University
Montreal, Canada

Research Assistant — *January 2013 - May 2013*

- Developing Java-based software to model and evaluate transient protein-protein interactions as a pharmaceutical tool for drug development and design.
- Member of a team of programmers developing, validating and iterating the software.
- Applied knowledge in biology and biophysics to design algorithms.

Dr. Zetka Lab, McGill University *Montreal, Canada*

Research Assistant *September 2013 - May 2013*

- Acquired primary data from C. elegans model organism, studying chromosomal interactions during meiosis.
- **Skills:** PCR genotyping, DNA extraction, preparing solid growth media, plasmid micro-injection, experimental design

Ville de Gatineau *Gatineau, Canada*

Head Lifeguard *Jun 2006 - August 2013*

- Training members of my lifeguarding team, evaluating competences and following up with weekly feedback.
- Ensuring a safe swimming and leisure environment for all members of the public and for my team through regular public relations and constant surveillance.
- Organizing various team-building activities and creating an enjoyable work atmosphere.

Papineau Minor Hockey League *Gatineau, Canada*

Hockey Referee *September 2005 - April 2010*

- Arbitrated hockey games and tournaments from the Novice levels, through to Midget.
- Trained and advised younger officials.
- Developed rapid decision-making skills due to fast-paced and high intensity environment.

Education

Carleton University *Ottawa, Canada*

Ph.D. Biomedical Engineering *September 2017 - Present*

- **Activities and Societies:** Founder & Director at the Infinity Institute, Co-Chair of the Carleton University Engineering in Medicine and Biology Student Club, Graduate Student Union Department Representative, Lecturer for the Enrichment Mini-Course Program, Science Fair Judge

Indian Institute of Technology Bombay *Mumbai, India*

Visiting Scholar *August 2016 - December 2016*

- **Activities and Societies:** DataGiri Member, Dandia Performer, Group for Rural Activities Volunteer

Carleton University *Ottawa, Canada*

M.A.Sc. Biomedical Engineering with Specialization in Data Science and Bioinformatics **[Fast-Tracked to PhD]** *September 2015 - September 2017*

- **Activities and Societies:** Co-Chair of the Carleton University Engineering in Medicine and Biology Student Club, Graduate Student Union Department Representative, Lecturer for the Enrichment Mini-Course Program, Science Fair Judge

McGill University *Montreal, Canada*

B.Sc. Biology and Computer Science, **CGPA: 3.40** *September 2011 - May 2014*

- **Activities and Societies:** VP Social for the McGill Biology Student Union, MORE Houses Representative, Go Club Competitor

Heritage College *Hull, Canada*

DEC Natural Sciences, **R-Score: 34.5** *September 2009 - May 2011*

- **Activities and Societies:** Student Union, Event Organizer

Skills

Programming	Python, R, MATLAB, Java, Visual Basic, C/C++
Web	PHP; JavaScript with Node.JS, React, D3.JS; HTML; CSS
Wet Lab	PCR Genotyping, DNA Extraction, Preparing Solid Growth Media, Plasmid Micro-Injection, Generation of Double Mutants (*C. elegans*)
Languages	**Mother Tongue:** English, French; **Intermediate:** Hindi; **Beginner:** Spanish

Publications & Posters

Comparison of Sequence- and Structure-Based Protein-Protein Interaction Sites — *K. Dick & J.R.Green*

Proceeding of IEEE International Student Conference — *Feb. 2016*

- DOI :: `10.1109/EMBSISC.2016.7508605`

Designing Anti-Zika Virus Peptides Derived from Predicted Human-Zika Virus Protein-Protein Interactions — *T. Kazmirchuk, K. Dick, et al.*

Journal of Computational Biology and Chemistry — *Sept. 2017*

- Preprint DOI: `https://doi.org/10.1101/156695`
- Journal DOI: `https://doi.org/10.1016/j.compbiolchem.2017.10.011`

Positome: A Method for Improving Protein-Protein Interaction Quality and Prediction Accuracy — *K. Dick, F. Dehne, A. Golshani, J.R. Green*

Proceedings of the IEEE International Conference on Computational Intelligence in Bioinformatics and Computational Biology 2017 — *Aug. 2017*

- DOI : `10.1109/CIBCB.2017.8058545`

Identifying Unvaccinated Individuals in Canada: A Predictive Model — *K. Dick, A. Nordstrom*

arXiv — *Jul. 2016*

- arXiv Preprint: `https://arxiv.org/abs/1607.08656`
- Poster presented at Data Day 3.0 Conference on March 29th, 2016
- Published on F1000: `https://f1000research.com/posters/5-1937`

Reciprocal Perspective for Improved Protein-Protein Interaction Prediction — *K. Dick, J.R. Green*

Submitted

- Scientific Reports Bioinformatics

Reciprocal Perspective Visualization Framework — *K. Dick, F. Charih, J.R. Green*

Manuscript in Preparation

- To be Submitted to PLoS Computational Biology

Protein-Protein Interaction Prediction of Malaria-Causing Parasites — *K. Dick, R. Chaudhary, V. Srinivas, J.R. Green, S. Patankar*

[Manuscript in Preparation]

A Framework for Improving Protein-Protein Interaction Predictions — *K. Dick, J.R. Green*

Poster Presented at Life Sciences Day

Deep Learning for Identifying Threats to Critical Infrastructure — *K. Dick, Y. Souley Dosso, L. Russell, J.R. Green*

Poster Presented at Data Day 4.0 — *Mar. 29, 2017*

Tongue Tracking using Convolutional Neural Networks and Transfer Learning — *Y. Souley Dosso, K. Dick, J.R. Green*

Poster Presented at Data Day 4.0 — *Mar. 29, 2017*

Teaching & Courses

COMP 4308/BIOC 4008 - Computational Systems Biology — *Carleton University*

Guest Lecturer — *Mar. 2018*

- **Reciprocal Perspective**
- Elaborated upon the Reciprocal Perspective framework for protein-protein interaction predictions.

HLTH 5350 – New Health Technologies

Carleton University

Guest Lecturer — *Nov. 2017*

- **The Genomic Era**
- Presented an overview of the emerging field of Complexity Science, recounted the history of genomic technologies, described current research (emphasizing the role of machine learning).

COMP 4308/BIOC 4008 - Computational Systems Biology

Carleton University

Guest Lecturer — *Mar. 2017*

- **Python Pipelining: An Introduction to Building Data Analysis Pipelines (& Hacking Graduate School)**
- Prepared and taught a fully interactive session on building flexible and scalable data analysis pipelines.
- Website: `http://bioinf.sce.carleton.ca/PythonPipelining/`

Enrichment Mini-Courses Program

Carleton University

Lecturer and Workshop Instructor — *May 2016 & 2017*

- Developed a day-long program accessible to High School students on the topic of Biomedical Informatics, Data Science, and Machine Learning.
- Developed a hands-on workshop to collect accelerometer data to create a ”Belt Buckle FitBit” to classify different types of activities.
- Implemented a basic MATLAB framework to access and analyze the data, including a competition to train the best classifier and achieve the highest overall accuracy.

SYSC 3303 - Real-Time Concurrent Systems

Carleton University

Teaching Assistant — *Summer 2017*

- Website: `http://www.sce.carleton.ca/courses/sysc-3303/s17/`

SYSC 3101 - Programming Languages

Carleton University

Teaching Assistant — *Winter 2016 & 2017 & 2018*

- Mentored and taught student basic principles of functional and object-oriented programming languages.

SYSC 1005 - Introduction to Software Development

Carleton University

Teaching Assistant — *Fall 2015 & 2017*

- Mentored and taught student basic principles of Python programming.

Extracurricular Activity

Health Science Inquiry

Toronto, Canada

News Reporter — *Obtober 2017 - PRESENT*

- Wrote articles on research being conducted by Canadian scientists
- Conducted phone and e-mail interviews with scientists to profile their work in greater detail
- Reported to the Manager of News Articles, and engaged in regular meetings and brainstorming sessions
- Contributed two articles spanning topics of health science research for publication in the annual circulation.

Infinity Institute

Ottawa, Canada

Director & Founder & Editor-In-Chief — *July 2017 - PRESENT*

- Founded the think tank and digital magazine, overseeing all aspects of running a not-for-profit digital magazine
- Oversaw the editorial process and managed a team of seven editors.
- Developed and executed marketing strategies to generate a strong community following.
- Coordinated group activities and club funding.
- Organized and ran numerous workshops, social, and professional development events.
- Designed and created all branding material and website presence.

Carleton University Engineering in Medicine and Biology Society

Ottawa, Canada

Co-Chair

September 2015 - PRESENT

- Coordinated group activities and club funding.
- Organized and ran numerous workshops, social, and professional development events.
- Helped coordinate a highly successful International Student Conference, an IEEE EMBS flagship event.

Graduate Student Association

Ottawa, Canada

Department Representative (Systems and Computer Engineering)

September 2015 - PRESENT

- Represented the Systems and Computer Engineering Department at the pan-university council meetings.
- Was a voting member of the council.
- Raised and discussed key issues about campus events and planned the future directions of the university as an advocate of the engineering faculty.

International Student Conference 2016

Ottawa, Canada & Jeju, South Korea

Core Member & Volunteer & Workshop Lecturer

May 2016

- Undertook various volunteering tasks: Program Committee, Publications Committee, Advertisement and Marketing Committee, etc.
- Ran a highly successful workshop targeted to High School students, title: *"Welcome to the World of Biomedical Engineering"*
- Helped secure over $3000 in funding to support our initiatives.
- Helped document the conference organization to enable future groups achieve similar levels of success.
- Received the **"Outstanding Performance Award"** on behalf of the ISC organization team at the Engineering in Medicine and Biology Society flagship conference 2017 in Jeju, South Korea.

Ottawa-Carleton Science Fair

Ottawa, Canada

Judge

April 2016 & 2017

- Judged the science fair projects of High School students throughout the National Capital region.
- Recommended the most prominent projects to advance to the final rounds.

Hacking Health Hackathon

Ottawa, Canada

Hackathon Participant & Blogger

May 2017

- Participated in the first Hacking Health Hackathon in Ottawa, as part of a team of 10 members innovating a three-part solution to improved Sleep Apnea diagnosis in children.
- Winner of the **Pilot Opportunity Award** enabling us to implement our solution at the Children's Hospital of Eastern Ontario
- Recapped my experience as a Blog article shared by Hacking Health Ottawa to disseminate the success of the event.
- **Article:** `http://hackinghealth.ca/hacking-health-ottawa-hackathon-2017/`

Hacking Health Ottawa

Ottawa, Canada

Blogger

January 2017 - PRESENT

- Participated in and reported on the ongoing events of Hacking Health Ottawa.
- As an avid writer and proponent for multidisciplinary innovation in healthcare, I am proud to contribute to Hacking Health's vision as Blogger!

McGill Biology Student Union

Montreal, Canada

VP Social

June 2013 - June 2014

- Organized and execution social events *(e.g.* Barbecues, pub-crawls, wines-and-cheeses, intra- and inter-departmental competitions), etc.
- Raised funds for the social events and charitable causes (over $3K raised in total)
- Participated in weekly MBSU meetings and led sub-committees.
- Held MBSU office-hours for three hours a week and managed transactions of office goods and services.

Honors & Awards & Grants

Domestic

2018	**Research Support Award**, Awarded to support the presentation of promising research at the **CRV 2018** conference in Toronto, Canada.	*NRC Digital Technologies Research Centre*
2017	**Koningstein Scholarship for Excellence in Science and Engineering**, Awarded annually to outstanding graduate students entering or enrolled in the Faculty of Science and the Faculty of Engineering and Design.	*Carleton FGPA*
2017	**Queen Elizabeth II Graduate Scholarships in Science and Technology**, Queen Elizabeth Scholars engage with communities, learn about cultures and create projects and actions that impact the world. Awarded for academic excellence, research potential, and leadership.	*Carleton FGPA*
2015	**Allan Buchanan Award**, For Academic Excellence.	*Carleton Academic Dept.*
2016	**2nd Place - Poster Competition**, Data Day 3.0 Conference	*Data Science Institute*
2009	**Lieutenant-Governor of Quebec Award**, For being a source of inspiration to others through exceptional volunteer work.	*Hull, Canada*

International

2017	**Outstanding Performance Award**, IEEE EMBS 2017 International Recognition	*Jeju, South Korea*
2016	**Mitacs Globalink Research Grant**, $10,000 research grant for four month collaborative study of *Plasmodium falciparum* at the Indian Institute of Technology Bombay.	*Mumbai, India*

Presentations & Invited Talks

Invited Speaker - IEEE EMBS & OttBUGS Seminar Series — *Carleton University*

Reciprocal Perspective for Protein Interaction Prediction and Related Complete Graph Problems — *Apr. 2018*

- Elaborated upon the Reciprocal Perspective framework for protein-protein interaction prediction and its applicability to prediction problems which can be modeled as complete graphs.

ISC 2016 Conference Workshop for High School Students — *Ottawa, Canada*

"Welcome to the World of Biomedical Engineering" — *May 2016*

- Described the breadth of the field of biomedical engineering, motivating examples from on-going research areas based on individuals in the program.
- Promoted Carleton University as a leader in the field
- Workshop was well received with several students and parents following-up with inquiries for additional information.

BIOM 5800 Seminar Series — *Ottawa. Canada*

"Interactome Analysis of Malaria-Causing Parasites and the Zika Virus" — *February 2016*

- Described two on-going research projects to graduate students and professors in the department.

Bioinformatics Research Group Presentation — *Ottawa. Canada*

"GitLab: A Collaboration Portal" — *February 2016*

- Described the basic principles of Git repositories and the advantages of using GitLab as a collaborative tool.
- Prepared a live instantiation of GitLab and provided customized access to the entire research group.
- Prepared several example documents and repositories to promote its use in future endeavors.

Writing

Health Science Inquiry — *www.healthscienceinquiry.com*

News Reporter — *Oct. 2017 - Present*

- Wrote two articles on the topics of ongoing Health Science research in Canada and published in the annual publication.

Infinity Institute *www.infinityinstitute.ca*

Founder & Writer *Aug. 2017 - Present*

- Wrote several articles on a broad range of topics for dissemination in the form of a digital magazine for the Canada-based Think Tank I founded.
- **Article:** *"World View: Sampling the Opinion of the Global Population"*

Hacking Health Ottawa *Ottawa, Canada*

Blogger *Jan. 2017 - PRESENT*

- Participated in events leading up to the Hackathon, drafted and published event recaps, and proof-read the work of other contributors.
- **Article ::** `http://hackinghealth.ca/hacking-health-ottawa-hackathon-2017/`
- **Article ::** `https://medium.com/@hhottawa/healthcare-design-thinking-workshop-4cc3830ab0ca#.8card29un`
- **Article ::** `http://hackinghealth.ca/hhottawa-pitch-clinic-101/`
- **Article ::** `http://hackinghealth.ca/hhottawa-startup-successes-healthcare/`
- **Article ::** `http://hackinghealth.ca/ibm-bluemix-workshop-part-2/`
- **Article ::** `http://hackinghealth.ca/ibm-technology-innovation/`
- **Article ::** `http://hackinghealth.ca/hacking-health-ottawa-silo-tions-healthcare-panel-breaking-silos-modern-healthca`

The Making of a Mumbaikar *www.mumbaikar.chasingtheinfinite.com*

Founder & Writer *Sept. 2016 - Dec. 2016*

- Captured my diverse experiences in the form of a blog while living in Mumbai, India during a four-month research project.

Professional Services

2018 **Reviewer**, Archives Of Phytopathology And Plant Protection

Committees

2017 **Blogger**, Hacking Health Ottawa Media & Publication Committee *Ottawa, Canada*

2016 **Member**, Program Committee, International Student Conference 2016 *Ottawa, Canada*

2013 **Member**, SOAR Committee *Montreal, Canada*

Hobbies

Sports Biking, Yoga, Hockey, Ballet, Swimming, Martial Arts

Music Piano, Guitar, Drums, Harmonica, Vocals

Art Doodling, Woodworking Projects, Poetry, Painting

Miscellaneous DIY Projects, Cosplaying, Reading

Summary

Polymath, Innovator, Adventurer. Passionately pursuing research in the fields of biomedical engineering, bioinformatics, data science and human genetics. I thrive on applying high performance computational techniques and machine learning to explore and expand our understanding of human health and disease, through the study of individual genomes, proteomes and interactomes for the development of personalized medicine. A natural leader and proponent for startup culture, I am seeking to develop novel solutions to healthcare challenges and fundamental tools to further scientific research; all in the hopes of improving and personalizing medical care for all.