

Dmitry Korkin, PhD

Associate Professor

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BACKGROUND

1. EDUCATION

- **Postdoc in Bioinformatics and Computational Biology**
University of California San Francisco, (2003-2007), Rockefeller University (2002)
- **Ph.D. in Computer Science**
Faculty of Computer Science, University of New Brunswick, NB, Canada, 2003
(GPA: 4.3 / 4.3)
- **M.Sc. in Mathematics, Applied Mathematics**
Faculty of Mechanics and Mathematics, Moscow State University, Moscow, Russia, 1999
(diploma with excellence)
- **B.Sc. in Mathematics, Applied Mathematics**
Faculty of Mechanics and Mathematics, Moscow State University, Moscow, Russia, 1997

2. WORK EXPERIENCE (NON-TEACHING)

- **Associate Director of Graduate Studies in Bioinformatics**, Informatics Institute, University of Missouri-Columbia, Columbia, MO, USA (2008-2010)
- **Postdoctoral Fellow**, University of California San Francisco, San Francisco, CA, USA, (PI: Prof. Andrej Sali, 2003–2007)
- **Postdoctoral Fellow**, Rockefeller University, New York, NY, USA, (PI: Prof. Andrej Sali, 2002–2003)
- **Predocctoral Fellow**, University of New Brunswick, Fredericton, NB, Canada, (PI: Prof. Lev Goldfarb, 2000-2002)
- **Visiting Researcher**, University of New Brunswick, Fredericton, NB, Canada, 1999

TEACHING

3. TEACHING EXPERIENCE

- **Associate Professor**, Dept. of Computer Science and Graduate Program in Bioinformatics and Computational Biology, courtesy appointment with Depts. of Applied Mathematics, Biology and Biotechnology, and Data Science Program, Worcester Polytechnic Institute, MA, USA (Aug. 2014-present)
- **Associate Professor with tenure**, Dept. of Computer Science and Informatics Institute, University of Missouri-Columbia, Affiliated with Christopher S. Bond Life Science Center, University of Missouri-Columbia Columbia, MO, USA (Aug. 2013- Aug. 2014)
- **Assistant Professor**, Dept. of Computer Science and Informatics Institute, University of Missouri-Columbia, Affiliated with Christopher S. Bond Life Science Center, University of Missouri-Columbia Columbia, MO, USA (2007-2013)

4. TEACHING INNOVATIONS

4.1 At WPI

TI1 Together with Prof. Reeta Rao (BBT) and Michael McGrade (Director, Graduate Admissions) co-organized an Undergraduate Symposium in Interdisciplinary Life Sciences to attract talented undergraduates to WPI graduate programs (BCB, BBT, CS, and others). The first symposium has been held in October 1, 2016.

TI2 Created course CS525/BCB590 “Unsupervised Learning” (currently offered as a CS Topics class, in CD terms of 2016). This is a comprehensive machine learning and data mining course offered at the graduate level and designed for scientists whose research involves data analysis. The current class includes a diverse range of graduate students from CS, BCB, DS, and RBE programs. The unique aspect of this course is in its innovative integration, through research projects and training to critically peer-review research papers, of the classical and most recent methods in unsupervised learning.

TI3 Created course CS 525/BCB590 “Bioinformatics of Disease”, a graduate course offered for CS and BCB graduate students. The course is designed to introduce the students to the state-of-the-art bioinformatics and computational biology methods to study diseases, such as infections, Mendelian disorders, and complex diseases. To the best of my knowledge, no such course has been offered elsewhere (although small parts of the course have been previously included into other bioinformatics courses).

TI4 Created course CS525/BCB590 “Algorithms in Bioinformatics” (currently offered as a CS Topics course). This is a course for the bioinformatics core of the Bioinformatics and Computational Biology program cross-listed with CS and offered at the level in MS. and in Ph.D. The unique aspect of this course is that it introduces some of the newest machine learning approaches (*e.g.*, deep learning and learning under privileged information, LUPI) that, to the best of my knowledge, are not offered in a bioinformatics course elsewhere.

TI5 Fully redesigned course BCB 401/501 / BB 4801/581 “Bioinformatics”. This is a fundamental course for the bioinformatics core of the Bioinformatics and Computational Biology program in BS, BS/MS, MS, and PhD. It is cross-listed with the Dept. of Biology and Biotechnology.

4.2 Before WPI

TI6 Created course CS 8120/INFOINST 8210: “Structural Bioinformatics of Proteins, Assemblies, and Systems”, a new Ph.D. topics course designed and taught for Department of Computer Science, University of Missouri-Columbia.

TI7 Created course CS 8120/INFOINST 8210: “Structural Bioinformatics of Proteins, Assemblies, and Systems”, a Ph.D. course designed and taught for Informatics Institute and Department of Computer Science, University of Missouri-Columbia

TI8 Created course CS 8001 “Computational and Systems Biology of Host-Pathogen Interactions”, a new Ph.D. course designed and taught for Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia. No analogous courses currently exist in other informatics/computer science programs nation-wide.

5. LECTURE COURSES TAUGHT

5.1 At WPI

N	Term	Course Number	Title	Student Count
C1	A, 2016	BCB4001/ BB4801	Bioinformatics	15 UGR
C2	A+B, 2016	BCB 501/BB 581	Bioinformatics	19 GR
C3	A+B, 2016	CS 534	Artificial Intelligence	69 GR
C4	C, 2016	BCB4001/ BB4801	Bioinformatics	15 UGR
C5	C+D, 2016	BCB590 / CS525	Unsupervised Learning	1 UGR 26 GR
C6	A+B, 2015	CS525	Bioinformatics of Disease	8 GR
C7	C+D, 2015	CS525	Algorithms in Bioinformatics	6 GR
C8	A+B, 2014	BCB4801 / 501 BB4801 / 581	Bioinformatics	20 UGR 9 GR

5.2 Before WPI

- C6 Spring, 2014 INFOINST 7005: “*Introduction to Bioinformatics: Tools and Applications*”, a team-taught service course for non-informatics graduate students offered by Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia. Coordinated and co-taught.
- C7 Fall, 2013 INFOINST 8350: “*Integrative Bioinformatics*”, a Ph.D. course designed and taught for Informatics Institute and Department of Computer Science, University of Missouri-Columbia
- C8 Fall, 2013 CS 8725/ECE 8725: “*Supervised Learning*” a Ph.D. course taught for Department of Computer Science and Department of Electrical and Computer Engineering, University of Missouri-Columbia.
- C9 Spring, 2013 CS 4070/7070: “*Numerical Methods for Computer Scientists and Engineers (Topics in Computer Science)*”, a 4000/7000-level course designed and taught for the Department of Computer Science, University of Missouri-Columbia
- C10 Spring, 2013 INFOINST 7005: “*Introduction to Bioinformatics: Tools and Applications*”, a team-taught service course for non-informatics graduate students offered by Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia. Coordinated and co-taught.
- C11 Fall, 2012 CS 8735/ECE 8735: “*Unsupervised Learning*” a Ph.D. course taught for Department of Computer Science and Department of Electrical and Computer Engineering, University of Missouri-Columbia.
- C12 Spring, 2012 CS 8001: “*Computational and Systems Biology of Host-Pathogen Interactions*” a Ph.D. course designed and taught for Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia.
- C13 Spring, 2012 INFOINST 7005: “*Introduction to Bioinformatics: Tools and Applications*”, a team-taught service course for non-informatics graduate students offered by Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia. Co-taught.
- C14 Spring, 2012 MMI 9432: “*MOLECULAR BIOLOGY II – 9432*”, a team-taught course for graduate students in Life Science Center. Co-taught a Bioinformatics/Systems Biology segment (2 lectures and project).
- C15 Fall, 2011 INFOINST 8350: “*Integrative Bioinformatics*”, a Ph.D. course designed and taught for Informatics Institute and Department of Computer Science, University of Missouri-Columbia
- C16 Spring, 2011 CS 4001/7001: “*Numerical Methods for Computer Scientists and Engineers (Topics*

- in Computer Science*)”, a 4000/7000-level course designed and taught for the Department of Computer Science, University of Missouri-Columbia
- C17 Spring, 2011 INFOINST 7005: “*Introduction to Bioinformatics: Tools and Applications*”, a team-taught service course for non-informatics graduate students offered by Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia. Coordinated and co-taught.
- C18 Spring, 2011 MMI 9432: “*MOLECULAR BIOLOGY II – 9432*”, a team-taught course for graduate students in Life Science Center, was invited to co-teach a Bioinformatics/Systems Biology segment (2 lectures and project)
- C19 Fall, 2010 CS 8120/INFOINST 8210: “*Structural Bioinformatics of Proteins, Assemblies, and Systems*”, a Ph.D. course designed and taught for Informatics Institute and Department of Computer Science, University of Missouri-Columbia
- C20 Spring, 2010 CS 4001/7001: “*Numerical Methods for Computer Scientists and Engineers (Topics in Computer Science)*”, a new 4000/7000-level course designed and taught for the Department of Computer Science, University of Missouri-Columbia
- C21 Spring, 2010 INFOINST 7005: “*Introduction to Bioinformatics: Tools and Applications*”, a team-taught service course for non-informatics graduate students offered by Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia. Co-taught.
- C22 Fall, 2009 CS 8001: “*Computational and Systems Biology of Host-Pathogen Interactions*”, a new Ph.D. course designed and taught for Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia.
- C23 Spring, 2009 INFOINST 7005: “*Introduction to Bioinformatics: Tools and Applications*”, a team-taught service course for non-informatics graduate students offered by Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia. Coordinated and co-taught.
- C24 Spring, 2009 INFOINST 8210: “*Structural Bioinformatics of Proteins, Assemblies, and Systems*”, a Ph.D. course designed and taught for Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia
- C25 Fall, 2008 INFOINST 8350: “*Integrative Bioinformatics*”, a new Ph.D. course designed and taught for Informatics Institute and cross-listed with the Department of Computer Science, University of Missouri-Columbia
- C26 Spring, 2008 CS 4970: “*Senior Capstone Design I*”, taught for Department of Computer Science, University of Missouri-Columbia
- C27 Spring, 2008 CS 8001: “*Structural Bioinformatics of Proteins, Assemblies, and Systems*”, a new Ph.D. topics course designed and taught for Department of Computer Science, University of Missouri-Columbia
- C28 Fall, 2007 “*Bioinformatics Reading Club*”, a new research seminar designed and coordinated for Department of Computer Science, University of Missouri-Columbia
- C29 2000–2002 Lecturer, Faculty of Computer Science, University of New Brunswick, Fredericton, NB, Canada. Courses: *Algorithms, Numerical Methods, Discrete Structures*
- C30 2001 Lecturer, Shad Valley program for gifted children, Shad International, Fredericton, NB, Canada. Courses: *Introduction to Bioinformatics*

6. UNDERGRADUATE PROJECTS (MQPS, IQPS, HONOR THESES, AND OTHER RESEARCH PROJECTS) ADVISED AND CO-ADVISED

6.1 At WPI

- S1 2016 Jonathan Sawin (CS), William Van Rensselaer (CS), Vakhtang Margvelashvili (CS),

- HoloNet: Visualization of biological network using Microsoft HoloLens augmented reality platform.* **MQP Project.** Terms A, B, C
- S2 2016 Jacob Komissar (BCB), *Structural and Functional Characterization of Frameshift Mutations*, **Undergraduate Research Project**, Term: E
- S3 2015 Zachary Zapatka (CS), *Disease Containment Protocols for Confined Environments.* **MQP Project.** Terms A, B
- S4 2014 Yifan Zhao (BCB), *Comparative bioinformatics methods to study evolution of Ebola virus.* **MQP Project.** Terms B, C, D
- S5 2014-2015 Andrew Lund (BCB), *Studying spread of an infectious disease through integrating geographic information systems, agent-based modeling, and epidemiology*, **Undergraduate Research Project**, Terms: B (2014), A, B, C, D (2015)

6.2 Before WPI

- S6 2013-2015: Jeffrey King, “*A new epidemiological model by integrating agent-based modeling and 3D GIS*”
- S7 2013-2014: Jonathan Price, “*Studying the effects of protein dosage and posttranscriptional modification on interaction network dynamics*”
- S8 2013: Eva Petrakovic, “*Disseminating interdisciplinary research to a general audience*”, “*A database of bacterial effectors*”
- S9 2012: Mandela Byam, “*Studying extreme evolution in Flaviviruses*”.
- S10 2010–2011: Andi Dhroso, “*Application of graph-based algorithms to cheminformatics*”.
- S11 2008–2010: Samantha Warren, “*Literature mining for Host-Pathogen Interactions*”, “*Bioinformatics and comparative genomics of H1N1 proteome*”
- S12 2007–2008: Brett Koenig, “*Structural characterization of alpha-superhelical proteins using a machine learning approach*”
- S13 2007–2008: Bryan Baugher, “*Handwritten character recognition*”

7. GRADUATE PROJECTS, THESES AND DISSERTATION ADVISED

7.1 At WPI

7.1.1 Ph.D. level

- PH1 2015-present: **Sahas Srinivasan**, DS, “*Agent-based and deep learning technologies in disease bioinformatics*”
- PH2 2015-present: **Oleksandr Narykov**, CS, “*Developing new generation of machine learning methods for bioinformatics of disease*”
- PH3 2014-present: **Nathan Johnson**, BCB, “*Studying alternative splicing as a regulatory mechanism in complex genetic disorders*”
- PH4 2014-present: **Hongzhu Cui**, BCB, “*Studying functional effect of mutation in disease-centered networks using network robustness theory*”
- PH5 2014-present: **Andi Dhroso**, BCB, “*A new computational paradigm to study extreme conservation in genome evolution*”

7.1.2 M.S. level

- MS1 2016-present: **Nathan George**, “*An integrative approach to autonomous quadcopter navigation: Combining reinforcement learning and supervised learning*”, Graduate ISP advisor
- MS2 2014-2016: **Katelyn Hughes**, “*Computational modeling and simulation of biological networks susceptible to variable gene expression*”. **Graduated**
- MS3 2015-2016: **Alyssa Tsiros**, industrial internship project advisor. **Graduated**

7.2 Before WPI

7.2.1 Ph.D. level

- PH6 2014 Nathan Johnson (transferred to WPI), “*Studying alternative splicing as a regulatory mechanism in complex genetic disorders*”
- PH7 2013–2014 Hongzhu Cui (transferred to WPI), “*Studying functional effect of mutation in disease-centered networks using network robustness theory*”
- PH8 2012–2014 Andi Dhroso (transferred to WPI), “*Studying biological network dynamics through data integration*”
- PH9 2011–2015 Samantha Warren, “*Evolution of influenza proteome: Forecasting viral jumps between species and reassortment events*”
- PH10 2010–2014 Xingyan Kuang, “*Database of macromolecular interactions*”
- PH11 2008–2014 Thanh Thieu, “*A structure-based machine learning approach for monitoring and detection of unusual human activity*”
- PH12 2008–2013 Bin Pang, Co-supervised with Prof. Chi-Ren Shyu. “*Structural classification of proteins using an evolutionary similarity measure*”
- PH13 2008–2012 Nan Zhao, Co-supervised with Prof. Chi-Ren Shyu. “*Structural bioinformatics of protein-protein interactions*”
- PH14 2008–2011 Jeff Renecker, Co-supervised with Prof. Chi-Ren Shyu. “*Long Identical Multispecies Elements in Animal and Plant genomes*”

7.2.2 M.S. level

- MS4 2013–2014 Gary McKenzie, “Using supervised learning and LUPI to assess the performance of college football players”
- MS5 2011–2014 Andi Dhroso, “*ChemETS: A computational framework for computer-aided drug design*”
- MS6 2009–2013 Xiaomin Wang, “*Detecting molecular mimicry in host-pathogen interactions*”
- MS7 2011–2012 Anitha Subramani, “*Evolutionary patterns in influenza proteome*”
- MS8 2010–2011 Sree Gopaluni, Supervised research project. “*PHI2WEB: A WEB 2.0 platform for Host-Pathogen Interactions*”
- MS9 2009–2011 Harshil Shah, Supervised research project. “*A community-driven Web Portal for working with Host-Pathogen Interaction data extracted by literature mining*”

8. INDEPENDENT STUDIES AND EDUCATIONAL OUTREACH ACTIVITIES

8.1 At WPI

- EO1 September, 2015-present: High school student research project advisor; Project title: “*A Structural Landscape of Frameshift Mutations*”, Niam Shah, Mass Academy.
- EO2 September, 2015-present: High school student research project advisor; Project title: “*Cancer Driven Co-Evolution in a TP53 Centered Network*”, Ashwin Chidambaram, Mass Academy.
- EO3 August, 2015: An invited visit and guest lecture at the Dynasty molecular and theoretical biology summer school for gifted high school students, Puschino, Russia.
- EO4 November, 2014: “*Bioinformatics of complex diseases*”. An invited talk at the international workshop dedicated to genomics research for undergraduate and high school students, Kazan, Russia.

8.2 Before WPI

- EO5 February, 2013 “*Systems biology: Studying Biological Networks*”: as MU Alpha Theta Guest

Speaker gave a systems biology lecture to high school students at Hickman High School, Columbia, MO

- EO6 May, 2013, “*HHMI Summer Institute for Biomedical Informatics*”: was one of several core faculty organizing a week-long workshop for undergraduate students recruited nation-wide as a part of “C3: Collaboration, Computation, Communication” program funded by Howard Hughes Medical Institute (HHMI).
- EO7 April, 2012 “*C3 Computational Biology Workshop*”: participate in a one-day computational biology workshop for the high school science teachers, as a part of “C3: Collaboration, Computation, Communication” program funded by Howard Hughes Medical Institute (HHMI).
Co-taught.

9. ACADEMIC ADVISING

9.1 At WPI

9.1.1 Undergraduate Students Advised (3)

- A1 Joshua Desmond (Class of 19, CS, BCB)
A2 Jacob Komissar (Class of 19, BCB, CS)
A3 Yifan Zhao (Class of 15, BCB)

9.1.2 Graduate Students Advised (5)

- A4 Suhas Srinivasan, (Ph.D. student, DS)
A5 Oleksandr Narykov, (Ph.D. student, CS)
A6 Hongzhu Cui, (Ph.D. student, BCB)
A7 Andi Dhroso, (Ph.D. student, BCB)
A8 Nathan Johnson (Ph.D. student, BCB)
A9 Katelyn Hughes, (M.S. student, BCB)

9.2 Before WPI

9.2.1 Undergraduate Students Advised (8)

- A10 Jeffrey King (CS student; research project advisor)
A11 Jonathan Price (CS student; research project advisor)
A12 Eva Petrakovic (CS student; research project advisor)
A13 Mandela Byam (CS student; research project advisor). Graduated. First job: a Coro Fellow in Leadership and Public Affairs at Focus St. Louis
A14 Andi Dhroso, (CS student; research project advisor). Graduated. Currently: a Ph.D. student at WPI
A15 Samantha Warren, (CS student; research project advisor). Graduated. Currently: a Ph.D. candidate at the University of Missouri
A16 Brett Koenig, (CS student; research project advisor). Graduated. Currently: a Ph.D. student at Georgia Tech
A17 Bryan Baugher, (CS student; research project advisor). Graduated

9.2.2 Graduate Students Advised and Co-Advised (12)

- A18 Samantha Warren (Ph.D. student, CS); expected to defend her thesis in summer 2015. First job secured: tenure-track faculty at Fontbonne University
A19 Xingyan Kuang, (Ph.D. student, Bioinformatics); thesis defended in 2014. First job: Postdoc in cancer bioinformatics at the Comprehensive Cancer Center, Ohio State University

- A20 Thanh Thieu, (Ph.D. student, CS); thesis defended in 2014. First job: Currently interviewing for a postdoc position
- A21 Bin Pang (Ph.D. student, Bioinformatics, Co-supervised with Prof. Chi-Ren Shyu); thesis defended in 2013. First job: Microsoft
- A22 Nan Zhao (Ph.D. student, Bioinformatics, Co-supervised with Prof. Chi-Ren Shyu); thesis defended in 2012. First job: research faculty at Mississippi State University
- A23 Jeff Renecker (Ph.D. student, Bioinformatics, Co-supervised with Prof. Chi-Ren Shyu); thesis defended in 2011. First job: IT consultancy
- A24 Gary McKenzie (M.S. student, CS); Project defended in 2014. First job: Cerner
- A25 Andi Dhroso, (M.S. student, CS); Thesis defended in 2014. Currently pursuing Ph.D. degree at WPI
- A26 Xiaomin Wang, (M.S. student, CS); Thesis defended in 2013. First job: Microsoft
- A27 Anitha Subramani (M.S. student, CS); Project defended in 2013. First job: Cerner
- A28 Sree Gopaluni (research project advisor, Bioinformatics); currently pursuing her M.S. degree.
- A29 Harshil Shah (research project advisor and thesis co-advisor, CS); Thesis defended in 2013. First job: DISH Network

9.2.3 Dissertation committees (26)

Note: in a chronological order; most recent—last.

- D1 Adrian Barb (Ph.D., Advisor: Chi-Ren Shyu, CS)
- D2 Tetsuya Kobayashi (M.S., Advisor: Chi-Ren Shyu, CS)
- D3 Sowjanya Paladugu (M.S., Advisor: Chi-Ren Shyu, CS)
- D4 Qingguo Wang (M.S., Advisor: Yi Shang, CS)
- D5 Yao Xu (M.S., Advisor: Dong Xu, CS)
- D6 Jason Green (Ph.D., Advisor: Chi-Ren Shyu, MUII)
- D7 Jesse Eickholt (Ph.D., Advisor: Jianlin Cheng, CS)
- D8 Blake Anderson (M.S., Advisor: Chi-Ren Shyu, CS)
- D9 Jaturon Harnsomburana (Ph.D., Advisor: Chi-Ren Shyu, MUII)
- D10 Dima Shin (Ph.D., Advisor: Chi-Ren Shyu, MUII)
- D11 Ion Gireada (M.S., Advisor: Chi-Ren Shyu, CS)
- D12 Xiaochen Yang (M.S., Advisor: Duan, CS)
- D13 Zhao Song (Ph.D., Advisor: Dong Xu, MUII)
- D14 Malik Al Jarad (Ph.D., Advisor: Yi Shang, CS)
- D15 Sam Grinter (Ph.D., Advisor: Xiaoqin Zou, MUII)
- D16 Avinash Vellaboyana Konda (M.S., Advisor: Chi-Ren Shyu, CS)
- D17 Chao Zhang (Ph.D., Advisor: Dong Xu, CS)
- D18 Qiuming Yao (Ph.D., Advisor: Dong Xu, MUII)
- D19 Ajay Mahendru (M.S., Advisor: Gordon Springer, CS)
- D20 Eric Armstrong (M.S., Advisor: Chi-Ren Shyu, CS)
- D21 Badri Adhikari (Ph.D., Advisor: Jianlin Cheng, CS)
- D22 Jacqueline Otto (M.S., Advisor: Ian Gizer, Psychology)
- D23 Chao Jiang (M.S., Advisor: Satish Nair, ECE)
- D24 Michael N. Gardner (Ph.D., Advisor: Melissa Mitchum, LSC)
- D25 Xiaoxiao Du (M.S., Advisor; Alina Zare, ECE)
- D26 Mohammad Fereidouni (M.S., Advisor: Jim Schoelz, Plant Sci)

SCHOLARSHIP

10. LIST OF PUBLICATIONS

Summary: Korkin has published **45** articles, including: **1** book chapter, **35** journal publications in the top bioinformatics, computational biology, computer science, and life sciences journals, and **9** conference proceedings. In total, his work has been cited **1,093** times (Google Scholar). He has **1** cover journal paper (FEBS, 2014). His co-authors include **Elizabeth Blackburn** (recipient of the 2009 Nobel Prize in Physiology or Medicine) and **Michael Freeling** (member of the National Academy of Sciences of USA).

Notes:

1. For the life sciences, informatics and other interdisciplinary journals, the key authors are usually the last author (a senior author coordinating the project, designing the approaches, writing the paper, etc.) and the first author (a junior author responsible for the implementation of the approaches, their assessment, and result analysis). However, when it is a joint interdisciplinary project between multiple labs, it may not necessarily be the case.
2. The listed papers are published in the journals that can be grouped into four basic categories, based on each journal's scope: (i) interdisciplinary scientific journal of a general interest (e.g., *Nature*), (ii) bioinformatics journals (e.g., *Bioinformatics*), (iii) specialized journals in applied areas of collaborations (e.g. *New Phytologists*), and (iv) data mining and algorithms journals (e.g., *IEEE Transactions on Knowledge and Data Engineering*). There are several rankings on the top-tier journals. Provided in supplementary documents are four top 20 ranked lists of journals according to Google Scholar ranking for each of the above categories.
3. Supervised and co-supervised students are underscored. WPI students are underscored and italicized.
4. **IF** corresponds to the ISI impact factor of the journal at the time the paper was published (when available).

10.1 Book chapters

- B1 Korkin D, Thieu T, Joshi S, Warren S. "Mining host-pathogen interactions", In: *Bioinformatics - Experimental Biology Systems*. Ed: Yang NS, INTECH, 2011; ISBN 978-953-307-280-7

10.2 Journal articles

- J1 Voitenko OS, Dhroso A, Feldmann A, Korkin D, Kalinina OV, "Patterns of amino acid conservation in human and animal immunodeficiency viruses", *Bioinformatics* (IF: 5.766) 32 (17), i685-i692
- J2 Williams M, Hoffman MD, Daniel JJ, Madren SM, Dhroso A, Korkin D, Givan SA, Jacobson SC, Brown PJ, "Short-stalked *Prosthecomicrobium hirschii* cells have a *Caulobacter*-like cell cycle", *Journal of Bacteriology*. (IF: 2.688), 2016 Feb 1. pii: JB.00896-15
- J3 Kuang X, Dhroso A, Han JG, Shyu CR, and Korkin D, "DOMMINO 2.0: integrating structurally resolved protein-, RNA-, and DNA-mediated macromolecular interactions", *Database* (IF: 4.457), 2016 Jan 30;2016. pii: bav114. doi: 10.1093/database/bav114
- J4 Zhang D, Cui H, Korkin D, Wu Z. "Incorporation of protein binding effects into likelihood ratio test for exome sequencing data" *BMC Proceedings*. (IF: N/A), 2015; 9 Suppl 8:S37
- J5 Cui H, Dhroso A, Johnson N, and Korkin D, "The variation game: Cracking complex genetic disorders with NGS and omics data", *Methods* (IF: 3.641), 2015, Jun; 79-80:18-31. doi: 10.1016/j.ymeth.2015.04.018
- J6 Pang B, Schlessman D, Kuang X, Zhao N, Shyu D, Korkin D, Shyu CR, "An Integrated Approach to Sequence-Independent Local Alignment of Protein Binding Sites", *IEEE/ACM Transactions on Computational Biology and Bioinformatics*. (IF: 1.536), 2015; DOI: 10.1109/TCBB.2014.2355208

- J7 Shin D, Arthur G, Popescu M, Korkin D, Shyu CR, "Uncovering influence links in molecular knowledge networks to streamline personalized medicine", *Journal of Biomedical Informatics* (IF: 2.482), 2014; 52, 394-405
- J8 Dhroso A, Korkin D, Conant G, "The yeast protein interaction network has a capacity for self-organization", *FEBS Journal*. (IF: 3.986), 2014; 281 (15), 3420-3432 (cover page feature)
- J9 Corominas R, Yang X, Lin GN, Kang S, Shen Y, Ghamsari L, Broly M, Rodriguez M, Tam S, Wanamaker SA, Tasan M, Lemmens I, Kuang X, Zhao N, Malhotra D, Michaelson JJ, Vacic V, Horvath S, Salehi-Ashtiani K, Roth FP, Tavernier J, Korkin D, Sebat J, Hill DE, Hao T, Vidal M, Iakoucheva LM. "Autism-centered interactome network reveals functional links between genetic risk factors for ASD", *Nature Communications* (IF: 10.742), 2014, Apr 11; 5:3650
- J10 Chen Z, Shin D, Chen S, Kovalenko M, Hadass O, Tomlison BN, Korkin D, Shyu CR, Cui J, Anthony DC, Gu Z, "Histological quantitation of brain injury using whole slide imaging: A pilot validation study in mice", *PLoS One* (IF: 3.534), 2014, Mar 17;9(3):e92133
- J11 Zhao N, Han JG, Shyu CR, Korkin D, "Determining effects of non-synonymous SNPs on protein-protein interactions using supervised and semi-supervised learning", *PLOS Computational Biology* (IF: 4.829), 2014, May 1;10(5):e1003592
- J12 Finch TM, Zhao N, Korkin D, Frederick KH, Eggert LS, "Evidence of Positive Selection in Mitochondrial Complexes I and V of the African Elephant", *PLoS One* (IF: 3.534), 2014, Apr 2;9(4):e92587
- J13 Warren S, Wan XF, Conant G, Korkin D, "Extreme evolutionary conservation of functionally important regions in H1N1 influenza proteome", *PLoS One* (IF: 3.730), 2013, Nov 25;8(11):e81027
- J14 Moretti R, ... 28 coauthors ..., Zhao N, Korkin D, ... 33 co-authors (participating groups are ordered alphabetically by PIs), Baker D. "Community-wide Evaluation of Methods for Predicting the Effect of Mutations on Protein-Protein Interactions"; *Proteins* (IF: 3.337), 2013 Jul 10. doi: 10.1002/prot.24356
- J15 T Liu S, Kandoth P, Warren S, Yeckel G, Heinz R, Alden J, Yang C, Jamai A, El-Mellouki T, Juvalle P, Hill J, Baum T, Cianzio S, Whitham S, Korkin D, Meksem K, and Mitchum M. "A Soybean Cyst Nematode Resistance Gene Points to a New Mechanism of Plant Resistance to Pathogens"; *Nature* (IF: 36.280), 2012, Dec 13;492(7428):256-60
- J16 Pang B, Kuang X, Zhao N, Korkin D, Shyu CR. "PBSword: a web server for searching similar protein-protein binding sites"; *Nucleic Acids Research* (IF: 8.026), 2012, Jul;40(Web Server issue):W428-34
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- J19 Thieu T, Joshi S, Warren S, Korkin D. "Literature Mining of Host-Pathogen Interactions: Comparing Feature-based Supervised Learning and Language-based Approaches"; *Bioinformatics* (IF: 5.468), 2012 Mar; 28(6):867-75
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- J22 Zhao N, Pang B, Shyu CR, Korkin D. “Charged Residues at Protein Interaction Interfaces: Unexpected Conservation and Orchestrated Divergence”; *Protein Science* (IF: 2.798), 2011 Jul;20(7):1275-84
- J23 Zhao N, Pang B, Shyu CR, Korkin D. “Structural similarity and classification of protein interaction interfaces”; *PLOS One* (IF: 4.092), 2011 May 12:6(5):e19554
- J24 Zhao N, Pang B, Shyu CR, Korkin D. "An accurate classification of native and non-native protein-protein interactions using supervised and semi-supervised learning approaches", *Proteomics* (IF: 4.505), 2011 Nov; 11(22): 4321-30
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- J31 Anderson CM, Korkin D, Smith DL, Makovets S, Seidel JJ, Sali A, Blackburn EH. “Tel2 mediates activation and localization of ATM/Tel1 kinase to a double-strand break”, *Genes and Development* (IF: 13.623), 2008 Apr; 22(7):854-9
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- J35 Russell RB, Alber F, Aloy P, Davis FP, Korkin D, Pichaud M, Topf M, Sali A. “A structural perspective on protein-protein interactions”, *Current Opinions in Structural Biology* (IF: 9.060), 2004; 14(3):313-24
- J36 Korkin D and Goldfarb L. “Multiple genome rearrangement: a general approach via the evolutionary genome graph”, *Bioinformatics* (IF: 4.615), 2002; 18 Suppl 1:S303-11

10.3 Conference Proceedings

- CP1 Voitenko O, Dhroso A, Feldmann A, Korkin D, and Kalinina O, “Patterns of amino acid conservation in human and animal immunodeficiency viruses”, *Proceedings of 15th European Conference on Computational Biology (ECCB 2016)*, in press
- CP2 Cui H and Korkin D, “Effect-specific analysis of pathogenic SNVs in human interactome: Leveraging edge-based network robustness”, *Proceedings of the 38th Annual International Conference of the IEEE Engineering in Medicine and Biology Society*, 2016
- CP3 Zhang D, Cui H, Korkin D, Wu Z, “Incorporation of Protein Binding Effects into Likelihood Ratio Test for Exome Sequencing Data”, *Proc of Genetic Analysis Workshop 19 (GAW19)*, 2015
- CP4 Pang B, Schlessman D, Kuang X, Zhao N, Shyu D, Korkin D, Shyu CR, "PBSalign: Sequence-Independent Local Alignment of Protein Binding Sites", *Proceedings of the IEEE International Conference on Bioinformatics and Biomedicine, 2013*; BIBM (Accept. rate: 19.8%) doi: 10.1109/BIBM.2013.6732456
- CP5 Wang Q, Pan M, Shang Y, Korkin D "A Fast Heuristic Search Algorithm for Finding the Longest Common Subsequence of Multiple Strings ", *Proceedings of the 22nd International Joint Conference on Artificial Intelligence*, 2010; AAAI-10 (Accept. rate: 26.9%)
- CP6 Wang J, Replogle A, Joshi S, Korkin D, Hussey R, Baum TJ, Davis EL, Wang X, and Mitchum MG. "Cellular targeting and host-specific recognition of cyst nematode CLE proteins", *Biology of Plant-Microbe Interactions*, Vol. 7, Congress on Molecular Plant-Microbe Interactions, Quebec City, 2009
- CP7 Zhao N, Pang B, Shyu CR, Korkin D "An accurate classification of native and non-native protein-protein interactions using supervised and semi-supervised learning approaches", *Proceedings on IEEE International Conference on Bioinformatics and Biomedicine, 2010*; BIBM, pp. 185-189
- CP8 Wang Q, Korkin D, Shang Y. "Efficient Dominant Point Algorithms for the Multiple Longest Common Subsequence (MLCS) Problem", *Proceedings of the 21st International Joint Conference on Artificial Intelligence*, 2009; IJCAI-09
- CP9 Korkin D, Wang Q, Shang Y. "An Efficient Parallel Algorithm for the Multiple Longest Common Subsequence (MLCS) Problem", *37th International Conference on Parallel Processing*, 2008; ICPP, pp.354-363

10.4 Journal and conference papers under review

- JCR1 Dhroso A, Warren S, and Korkin D, “Genome-wide prediction of bacterial effectors across six secretion system types using a feature-based statistical framework”, *PLoS Computational Biology*, in revision
- JCR2 Gruzdev V, Korkin D, Mooney BP, Havelund JF, Møller IM, Thelen JJ, “Controlled modification of peptides and proteins by ultrashort laser pulses in polar solvents”, *Nature Communications*, submitted

10.5 Journal articles in preparation

- JP1 Dhroso A, Warren S, Phinney MA, Petakovic E, Shyu CR, Korkin D, “BacPaC: A Database of Bacterial Effectors, Predicted and Curated”
- JP2 Thieu T, Dhroso A, Korkin D, “Classifying human actions in still images: A symbolic learning approach using 2D pose graphs”
- JP3 Johnson NT, Prasad N, Spollen B, Korkin D, Levy SE, Bryda EC “Transcriptome Profiling of Rattus norvegicus Embryonic Stem Cells by RNA-sequencing”

- JP4 Kuang X, Dhroso A, Cui H, Johnson NT, He Z, Xu D, Korkin D, “Exploring functional importance of somatic mutations in cancer by systematic de novo binding site annotation”
- JP5 Johnson N, Dhroso A, Hughes K, and Korkin D, “RNA-Seq in biological classification: Can alternative splicing enhance machine learning?”
- JP6 Hughes K, Narykov A, Johnson NT, and Korkin D, “Detecting gene fusion cancer drivers using tissue-specific learning classifiers”

10.6 Conference abstracts

- C1 Dhroso A, Korkin D, “Cancer cell line prediction using isoform signaling”, *Gordon Research Conference: Human Single Nucleotide Polymorphisms & Disease*, Mount Holyoke College, South Hadley, MA, June 12-17, 2016
- C2 Johnson NT, Dhroso A, Cui H, Kuang X, Korkin D, “Biological Implications of Single Nucleotide Variations on Protein Binding in Cancer”, *Gordon Research Conference: Human Single Nucleotide Polymorphisms & Disease*, Mount Holyoke College, South Hadley, MA, June 12-17, 2016
- C3 Cui H, Zhao N, Korkin D, “Effect-specific analysis of pathogenic SNVs in human interactome suggests new mechanistic details underlying genetic disease”, *Gordon Research Conference: Human Single Nucleotide Polymorphisms & Disease*, Mount Holyoke College, South Hadley, MA, June 12-17, 2016
- C4 Hughes K, Narykov O, Johnson N, Korkin D, “Determining oncogenic potential of gene fusions”, *Cold Spring Harbor Laboratory Meetings. Systems Biology: Global Regulation of Gene Expression 2016*, Cold Spring Harbor Laboratory, NY, March 17-21, 2016
- C5 Dhroso A, Cui H, Johnson N, Kuang X, Korkin D, “A comprehensive system-wide analysis of SNVs associated with protein binding sites across eight cancer types”, *Cold Spring Harbor Laboratory Meetings. Systems Biology: Networks*, Cold Spring Harbor Laboratory, NY, March 17-21, 2015 (selected for oral presentation)
- C6 Warren S, Korkin D, “Extreme conservation and divergence of functional regions in Influenza A pandemic subtypes: A peaceful journey or a wild ride?” *The 22nd International Conference on Intelligent Systems for Molecular Biology (ISMB 2014)*, Boston, MA, July 10-15
- C7 Dhroso A, Johnson NT, Shyu CR, Pires JC, Conant G, Korkin D, “Detecting ancient elements of extreme conservation in eukaryotic genomes using hash mapping and cache-aware in-memory computing” *The 22nd International Conference on Intelligent Systems for Molecular Biology (ISMB 2014)*, Boston, MA, July 10-15
- C8 Johnson NT, Dhroso A, Prasad N, Spollen B, Korkin D, Levy SE, Bryda EC, “Transcriptome Profiling of *Rattus norvegicus* Embryonic Stem Cells by RNA-sequencing”, *The 22nd International Conference on Intelligent Systems for Molecular Biology (ISMB 2014)*, Boston, MA, July 10-15
- C9 Dhroso A, ShyuCR, Pires JC, Conant G, Korkin D, “Detecting genomic elements of extreme conservation in higher eukaryotes by integration of hash mapping and cache-aware in-memory computing”, *Keystone Symposium: Big Data in Biology*, San Francisco, CA, March 23-25, 2014
- C10 Zhao N, Kuang X, He Z, Shyu CR, Xu D, Korkin D, “Predicting protein binding sites on homology models by a guided integration of sequence and structure data”, *The 20th International Conference on Intelligent Systems for Molecular Biology (ISMB 2012)*, Long Beach, CA, July 15-17, 2012
- C11 Kuang X, Han,J, Zhao N, Pang B, Shyu CR, Korkin D, “DOMMINO: Towards integrating

- DNA-, RNA-, and protein-mediated macromolecular interaction data”, *The 20th International Conference on Intelligent Systems for Molecular Biology (ISMB 2012)*, Long Beach, CA, July 15-17, 2012
- C12 Warren S, Conant G, Korkin D, “Predicting protein binding sites on homology models by a guided integration of sequence and structure data”, *The 20th International Conference on Intelligent Systems for Molecular Biology (ISMB 2012)*, Long Beach, CA, July 15-17, 2012
- C13 Zhao N, Pang B, Shyu CR, Korkin D. “Understanding protein-protein interactions: Efficient classification of physiological and non-physiological protein complexes and unexpected conservation in interaction interfaces”, *The 19th International Conference on Intelligent Systems for Molecular Biology and 10th European Conference on Computational Biology (ISMB/ECCB 2011)*, Vienna, Austria, July 17-19, 2011
- C14 Warren S, Conant G, Korkin D. “Extreme conservation in intra-viral interactions of the influenza proteome”, *Great Lakes Bioinformatics Conference (GLBIO 2011)*, Athens, OH, USA, May 2-4, 2011
- C15 Thieu T, Joshi S, Warren S, Korkin D. “Mining host-pathogen interactions from biomedical literature”, *The 18th International Conference on Intelligent Systems for Molecular Biology (ISMB 2010)*, Boston, MA, July 9-13, 2010
- C16 Joshi S and Korkin D. “An accurate prediction of bacterial effectors using a feature-based supervised learning approach”, *The 18th International Conference on Intelligent Systems for Molecular Biology (ISMB 2010)*, Boston, MA, July 9-13, 2010
- C17 Warren S, Conant G, Korkin D. “The Pearls of Swine Flu: The structural and sequence evolution of the H1N1 proteome”, *The 18th International Conference on Intelligent Systems for Molecular Biology (ISMB 2010)*, Boston, MA, July 9-13, 2010
- C18 Zhao N, Pang B, Shyu CR, Korkin D. “Similarity in protein-protein interactions: Disappearing and reappearing act by key interface residues”, *The 18th International Conference on Intelligent Systems for Molecular Biology (ISMB 2010)*, Boston, MA, July 9-13, 2010
- C19 Pang B, Zhao N, Shyu CR, Korkin D. “Efficient Retrieval of Protein Interfaces with a Machine Learning-based Similarity Measure”, *The 18th International Conference on Intelligent Systems for Molecular Biology (ISMB 2010)*, Boston, MA, July 9-13, 2010
- C20 Zhao N, Pang B, Shyu CR, Korkin D. "Structural classification and retrieval of protein interfaces: Detecting homology and analogy in protein interactions", *The 17th International Conference on Intelligent Systems for Molecular Biology and 8th European Conference on Computational Biology (ISMB/ECCB 2009)*, Stockholm, Sweden, June 27-July 2, 2009
- C21 Korkin D, Chiu W, Frydman J, Sali A. "Predicting configuration of homologous subunits in protein assemblies", *The 16th International Conference on Intelligent Systems for Molecular Biology (ISMB 2008)*, Toronto, ON, Canada, July 19-23, 2008
- C22 Korkin D, Davis FP, Alber F, Sali A. “Modeling Protein Complexes Using Comparative Patch Analysis”, *The 2006 Computational Systems Bioinformatics Conference*, Stanford, CA, USA, August 14-18, 2006
- C23 Korkin D, Davis FP, Sali A. “Localization of protein binding sites within families of homologous proteins”, *The 13th International Conference on Intelligent Systems for Molecular Biology*, Detroit, MI, USA, June 25-29, 2005
- C24 Korkin D. "On a new model for cheminformatics: Learning the classes of compounds", *The 224-th National ACS Meeting, Division of Chemical Information*, Boston, MA, USA, August 18-22, 2002
- C25 Korkin D and Goldfarb L. “Multiple Genome Rearrangement: A General Approach via the

- Evolutionary Genome Graph”, *The 10th International Conference on Intelligent Systems for Molecular Biology*, Edmonton, AL, Canada, August 3-7, 2002
- C26 Goldfarb L, Golubitsky O, Korkin D. “Fundamentally new form of structural representation in chemistry”, *The 222-nd National ACS Meeting*, Division of Computers in Chemistry, Chicago, IL, USA, August 26-30, 2001
- C27 Korkin D. “Which formal models do we need in life sciences?”, *Graduate Research Conference*, University of New Brunswick, February 2001
- C28 Korkin D. “On a new, evolutionary, form of object representation in bioinformatics”, *Atlantic Bioinformatics*, Fredericton, NB, Canada, June 2000
- C29 Korkin D. “Constructing secure database systems via the network pump”, *The International Conference On Intelligent Systems*, Moscow State University, Moscow, Russia, October 1998

Technical reports

- R1 Goldfarb L, Gay D, Golubitsky O, Korkin D, "What is a structural representation? Second variation", Faculty of Computer Science, U.N.B., *Technical Report*, TR04-165, 2004
- R2 Korkin D. “On a Novel Evolutionary Based Model for Genome Rearrangement”, Faculty of Computer Science, University of New Brunswick, *Technical Report*, TR02-150, 2002
- R3 Korkin D. “A new dominant point-based parallel algorithm for multiple longest common subsequence problem”, Faculty of Computer Science, University of New Brunswick, *Technical Report*, TR01-148, 2001
- R4 Goldfarb L, Golubitsky O, Korkin D. “What is a structural representation in chemistry: Towards a unified framework for CADD?” Faculty of Computer Science, University of New Brunswick, *Technical Report*, TR00-138, 2000
- R5 Goldfarb L, Golubitsky O, Korkin D. "What is a structural representation?", Faculty of Computer Science, U.N.B., *Technical Report*, TR00-137, 2000

Theses

- TH1 Korkin D. "A new model for molecular representation and classification: A formal approach based on the ETS framework", Faculty of Computer Science, University of New Brunswick, *Ph.D. Thesis*, February 2003
- TH2 Korkin D. “Analysis of covert channels via their simulation as automata with probabilistic output”, Faculty of Mechanics and Mathematics, Moscow State University, *M.Sc. Thesis*, 1999

11. GRANTS

11.1 At WPI

11.1.1 Awarded Grants:

- G1 2016-2019: “REU SITE: Data Science Research for Safe, Sustainable and Healthy Communities”, **\$367,500**, Key Personnel (PI: Elke Rundensteiner), NSF
- G2 2015-2018: “ABI Innovation: Discovering Elements of Extreme and High Conservation in Eukaryotic Genomes”, **\$768,000**, PI, NSF
- G3 2015-2016: “Understanding the Biological Effects of Intense Terahertz Radiation on Cancer Cells”, **\$20,000**, PI (Other PIs: Michael Green, UMass Med School and Lyubov Titova, WPI), WPI-UMMS Collaborative Seed Funding Grant Program

- G4 2014-2017: “Modulation Of Host Defense Responses By Soybean Cyst Nematode Effectors”, **\$485,000**, co-PI (PI: Thomas Baum, Iowa State), USDA

11.1.2 Pending Grants:

- PG1 “NSF MRI: Acquisition of an Instrument for Data-Intensive and Large-Scale In-Memory Computation to Support Interdisciplinary Research and Education”, NSF, (role: PI), **\$861,791**
- PG2 “preciselyMe: The Personalized Medicine Technology Center for PMI Cohort Participants”, NIH U24, (role: co-I; Program Directors: Elke Rundensteiner, WPI and Kajal Claypool, MIT Lincoln Labs; other co-I’s: Emmanuel Agu, WPI, Mohamed Eltabakh, WPI, Daniel Hannon, MIT Lincoln Labs, Daniela Bourges-Waldegg, MIT Lincoln Labs, and Darrell Ricke, MIT Lincoln Labs), **\$9,313,293 (WPI part)**

11.1.3 In preparation:

- PR1 “Data-driven methods to characterize effects of alternative splicing on protein interactions”, NIH R01, (role: PI), **\$TBD**
- PR2 “Disease Association Studies: A Machine Learning Driven Network Approach”, NIH R01 (role: PI), **\$TBD**

11.1.4 Submitted but Not Awarded Grants:

- NA1 2015: “Disease Association Studies by Integrating Systems Data”, **\$1,461,995**, PI, NIH R01
- NA2 2015: “NRT-DESE: Trans-Disciplinary Data Science Training For Building The 21st Century Smart City”, **\$2,990,611**, co-PI, NSF
- NA3 2015: “MRI: Acquisition of an Instrument for Data-Intensive and Large-Scale In-Memory Computation to Support”, **\$728,785**, PI, NSF
- NA4 2014: “NRT-DESE: Immersive Data Science Training For Scientific and Engineering Innovation”, **\$2,958,465**, co-PI, NSF
- NA5 2014: “PGRP: An Integrated Platform for Studying a Disease Resistance-Centered Gene Network in Soybean”, **\$4,184,160.00**, co-PI, NSF
- NA6 2014: “Disease Association Studies by Integrating Systems Data”, **\$1,484,729**, PI, NIH R01

11.2 Before WPI

11.2.1 Awarded Grants:

- G5 2014-2017: “REU: Educating for the grand challenges at the intersection of biocomplexity and high-performance computing”, NSF REU, **\$307,664**, Co-PI (16%; PI: Gavin Conant)
- G6 2011-2013: “Bayesian Variable Selection and Grouping”, NSF MPS, **\$121,279**, Co-PI (multi-project proposal, 5%; PI: Sounak Chakraborti)
- G7 2011-2013: “Socially intelligent computing in action: Building a community-driven platform for host-pathogen interactions”, Mizzou Advantage, **\$50,000**, PI
- G8 2011-2013: “Identification and Pharmacological Targeting of the C-peptide Receptors”, Mizzou Advantage, **\$50,000**, Co-PI (PI: Bradley Anderson)
- G9 2011-2013: “Selective Controlled Femtosecond Laser-Induced Chemical Reactions in Peptide Systems”, Mizzou Advantage, **\$50,000**, Co-PI (PI: Jay Thelen)
- G10 2010-2014: “Meeting the Nation's Needs in Emerging Areas of Computer Science”, US Department of Education, **\$481,305**, Co-PI (14%; PI: Chi-Ren Shyu)
- G11 2009-2014: “CAREER: A Computational Approach to Study Molecular Mimicry in Host-Pathogen Interactions”, NSF CAREER, **\$613,490**, PI (100%)
- G12 2008-2009: “Predicting molecular mimicry in host-pathogen interactions”, MU Research Board, **\$30,000**, PI (100%)

- G13 2002: Travel Grant, University of New Brunswick, Canada (for paper presentation at ISMB 2002)
- G14 2001: Faculty Research and Travel Grants, Faculty of Computer Science, University of New Brunswick, Canada (for paper presentation at the National ACS Meeting, Div. of Computers in Chemistry)

12. RECENT INVITED PROFESSIONAL TALKS AND PRESENTATIONS

12.1 At WPI

- T1 June, 2016: “Advancing the Field of Disease Informatics with Machine Learning”, Computer Science Institute for Women, University of Missouri, Columbia, MA (invited by *Dr. Deanna Lankford, Research Associate, Dept. of Education*)
- T2 May, 2016: “The Variation Game: Studying Impact of Genetic and Post-Transcriptional Variations at the Systems Level”, Channing Network Science Seminar, Harvard University, Cambridge, MA (invited by *Prof. Yang-Yu Liu, Harvard Medical School*)
- T3 Apr, 2016: Variation Games in Complex Genetic Disorders, Northeastern University, Boston, MA (invited by *Prof. Dima Krioukov, Department of Physics, Department of Electrical&Computer Engineering*)
- T4 Oct, 2014: Postgenomic methods of analysis in biology, and laboratory and clinical medicine (PostGenome 2014), Kazan, Russia (invited by *Dr. Oleg Gusev, Kazan State University*)

12.2 Before WPI

- T5 Jan., 2014: Worcester Polytechnic Institute, Worcester, MA
- T6 Oct., 2013: MU Informatics Symposium, Columbia, MO
- T7 Jan., 2013: Plant and Animal Genome Paleogenomics conference, San Diego, CA
- T8 Nov., 2012: Postgenomic methods of analysis in biology, and laboratory and clinical medicine (PostGenome 2012), Kazan, Russia (invited by *Dr. Oleg Gusev, Kazan State University*)
- T9 Oct., 2012: 30th Symposium of Veterinary Comparative Respiratory Society (VCRS 2012), Columbia, MO (invited by *Prof. Carol Reinero, College of Veterinary Medicine, University of Missouri*)
- T10 Sept., 2012: Georgia Institute of Technology, School of Mathematics, Mathematical Biology and Ecology Seminar (invited by *Prof. Yuri Bakhtin, currently at Courant Institute, New York University*)
- T11 April, 2012: University of Missouri, Department of Pathology, School of Medicine Seminar Series (invited by *Prof. Gerald Arthur, Department of Pathology and Anatomical Science*)
- T12 April, 2012: University of Southern California, Molecular and Computational Biology Seminar Series (invited by *Profs. Xianghong Jasmine Zhou and Frank Alber, Depts. of Biological Sciences and Computer Science*)
- T13 Mar., 2012: Vanderbilt University, Cancer Biostatistics Workshop (invited by *Prof. Zhongming Zhao, currently at School of Biomedical Informatics, The University of Texas Health Science Center at Houston*)
- T14 July, 2011: Moscow Conference on Computational Molecular Biology (MCCMB'11), Moscow, Russia

13. PROFESSIONAL SOCIETY MEMBERSHIPS AND OFFICES

- American Association for the Advancement of Science, member
- International Society for Computational Biology, member

- American Chemical Society, Division of Chemical Information, member
- University of new Brunswick Computer Science Graduate Student Association, president

14. EDITORIAL, CONFERENCE ORGANIZATION AND REFEREE SERVICES

14.1 Editorial Board

- EB1 2013-present: *Editorial Board*, Nature Scientific Reports
- EB2 2013-present: *Editorial Board*, Frontiers in Ecology and Evolution
- EB3 2012-present: *Editorial Board*, Dataset Papers in Bioinformatics
- EB4 2012-present: *Editorial Board*, International Journal of Computational Biology and Drug Design (IJCBD)
- EB5 2009-2011: *Managing Editor*, International Journal of Computational Biology and Drug Design (IJCBD)

14.2 Journal Peer Review Service

- PR1 Bioinformatics
- PR2 Journal of Structural Biology
- PR3 Nucleic Acids Research
- PR4 Plant Cell
- PR5 Proceedings of the National Academy of Sciences
- PR6 Protein Engineering
- PR7 Protein Science
- PR8 Structure
- PR9 PLOS One
- PR10 PLOS Computational Biology
- PR11 Scientific Reports
- PR12 Molecular BioSystems
- PR13 Bioinformatics
- PR14 Briefings in Bioinformatics

14.3 Conference Program Committee Service

- PC1 Member, technical program committee, IEEE 16th International Conference on Bioinformatics and BioEngineering (BIBE), 2016
- PC2 Member, program committee, International Joint Conference on Artificial Intelligence (IJCAI), 2016
- PC3 Program Committee, International Conference on Intelligent Biology and Medicine (ICIBM), 2015
- PC4 2014: Program Committee, 4th IEEE International Conference on Computational Advances in Bio and Medical Sciences (ICCBMS 2014), Miami, FL, USA
- PC5 2013: Program Committee, International Conference on Intelligent Biology and Medicine
- PC6 2013: Program Committee, MCBIOS Conference, Columbia, MO, USA
- PC7 2012: Program Committee, Missouri Informatics Symposium, Columbia, MO, USA
- PC8 2009: Tutorials co-chair, IEEE International Conference on Bioinformatics & Biomedicine, Washington D.C., USA
- PC9 2008: 2nd International Workshop on Machine Learning in Biomedicine and Bioinformatics (MLBB), San Diego, CA, USA

15. HONORS, AWARDS, AND OTHER RECOGNITION RELATED TO SCHOLARSHIP

15.1 To Korkin

- A1 2013 Junior Research Faculty of the Year Award, College of Engineering, University of Missouri-Columbia
- A2 2009 NSF CAREER Award (see Grants for details)
- A3 2002 ISCB Travel Fellowship, The International Society for Computational Biology
- A4 2001 Sasi Mohal Pal Memorial Prize (the best academic performance), University of New Brunswick, Canada
- A5 1999 Gold medal and Diploma with Excellence (excellent academic performance), Moscow State University

15.2 To Korkin's Advised and Co-Advised Students

15.2.1 At WPI:

- SA1 2016 WPI Graduate Student Travel Fund, **Katelyn Hughes**
- SA2 Cold Spring Harbor Labs (CSHL) Travel Stipend, to present work at "Systems Biology: Global Regulation of Gene Expression, 2016" meeting at CSHL, **Katelyn Hughes**
- SA3 Finalist for the 2014 WPI GRIE Poster Competition, **Andi Dhroso**

15.2.2 Before WPI:

- SA4 Undergraduate Award at the 2014 MU Life Science Week Annual poster competition, Jeff King
- SA5 2014 ISCB Travel Fellowship to present our work at the ISMB 2014 conference (the main conference in bioinformatics and computational biology), Samantha Warren
- SA6 1st place at MU CS Annual poster competition, Samantha Warren
- SA7 2013 Keystone Symposia Future of Science Fund scholarship, Andi Dhroso
- SA8 3rd place in Missouri Informatics Symposium 2013, Samantha Warren
- SA9 1st place in poster competition at the 2012 MU Life Science Week, Samantha Warren
- SA10 2nd place in poster competition at 2012 MCBIOS Conference, Xingyan Kuang
- SA11 3rd place in poster competition at 2012 MCBIOS Conference, Bin Pang
- SA12 NSF Educational Workshop Travel award for ABRF 2012 (only 17 were awarded nationwide), Nan Zhao
- SA13 DOE GAANN Fellowship, Samantha Warren
- SA14 Shumaker Fellowships, Xingyan Kuang, Nan Zhao, Bin Pang
- SA15 3rd place in poster competition at the 2011 MU Life Science Week, Nan Zhao
- SA16 Best undergraduate poster at the 2010 MU Life Science Week, Samantha Warren

16. CITATIONS

Summary: Korkin has **1,093** citations (Google Scholar), including **383** citations since 2014 (the year he was hired by WPI) to present. A detailed citation index of all publications is provided with the additional documents.

SERVICE TO

17. PROFESSION

17.1 Grant Panel Service

- GR1 2009-present: NSF ABI review panelist
- GR2 2008-present: NIH/NLM review panelist (ZLM1)
- GR3 2013: Pilot Project Grants external review panel, Vanderbilt Center for Quantitative Sciences
- GR4 2012: NSF Graduate Research Fellowship Program (GRFP) review panelist
- GR5 2011-2012: Open grant competition of the Government of the Russian Federation review panelist

18. DEPARTMENT AND UNIVERSITY-- COMMITTEE AND ADMINISTRATIVE ASSIGNMENT

18.1 At WPI

- S1 Co-Organizer, *next-in-BIO*, Undergraduate Research Symposium, October 1, 2016
- S2 Member, CS Graduate Research Committee, 2016-present
- S3 Member, WPI HPC Steering Group, February 2016-present
- S4 Member, CS Graduate Council, 2015-2016
- S5 Member, CS Colloquium, 2015-2016
- S6 Chair, Industrial Relationship Committee, BCB Program, 2015-present
- S7 Member, WPI Bioinformatics and Computational Program Committee, 2014-present
- S8 Member, CS Graduate Committee, August 2014-2015

18.2 Before WPI

- S9 2013-2014: Co-Chair, MU Informatics Institute Initiative in Translational Bioinformatics and Personalized Medicine
- S10 2012-2014: Graduate Committee, Dept. of Computer Science, University of Missouri
- S11 2010-2014: Curriculum Committee, MU Informatics Institute
- S12 2009-2010: Co-Chair of Graduate Committee, MU Informatics Institute
- S13 2009-2010: Director of Graduate Studies in Bioinformatics, MU Informatics Institute
- S14 2008–2014: Doctoral Faculty, MU Informatics Institute
- S15 2007–2009: Undergraduate Committee, Dept. of Computer Science, University of Missouri
- S16 2007–2014: Doctoral Faculty, Department of Computer Science, University of Missouri