

## EDUCATIONS

### PhD. Degree in Computer Science (2013)

*Georgia State University, Atlanta, GA*

**Advisor:** Dr. Alex Zelikovsky

**Dissertation:** Viral Quasispecies Reconstruction Using Next Generation Sequencing Reads.

*Developed efficient algorithmic techniques for assembling viral quasispecies sequences (RNA viruses (HCV,HIV,IBV) and DNA viruses (HBV)) from 454 Life Sciences reads and estimate their frequencies.*



### MS. Degree in Methods of Teaching Mathematics

*An-Najah National University, West Bank*

**Advisor:** Dr. Salah Yaseen

**Thesis:** The Effect of Programmed Instructions Learning Method on the 9th Grade Students Achievements in Mathematics.

### BSc. Degree major Computer Science, minor Mathematics

*Al-Quds University, Jerusalem*

## CERTIFICATES

- Microsoft Certified Solution Developer.
- Microsoft Certified Professional.
- Introduction to Oracle Administration by ATS Approved Oracle Education Partner.

## FELLOWSHIPS AND HONORS

- Spring/2011: Georgia State University Molecular Basis of Disease Initiative (MBD) fellowship.
- Fall/2011: Georgia State University Molecular Basis of Disease Initiative (MBD) fellowship.
- Fall/2012: Georgia State University Molecular Basis of Disease Initiative (MBD) fellowship

## AWARDS

MBD Travel Award to give a talk about “Bioinformatics Methods for Reconstruction of Infectious Bronchitis Virus Quasispecies from Next Generation Sequencing Data”, in the 11th International Conference on Molecular Epidemiology and Evolutionary Genetics of Infectious Diseases(MEEGID XI), October 30 – November 2, 2012, New Orleans, USA.

## TEACHING EXPERIENCE (UNIVERSITY LEVEL)

implementing a variety of teaching strategies with strong theoretical and practical background to produce an exciting classroom experience.

Al-Quds Open University, Ramallah (2002-2006)

**Courses:** Introduction to Computing, Database.

Georgia State University, Atlanta, GA (2008 – 2013)

**Courses:** Java for Bioinformatics , Introduction to Computer Science, and Computers and Applications.

**Teaching Assistant,** Georgia State University, Atlanta, GA (2008 – 2013)

**Courses:** Computers and Applications, Database Systems, Web Programming.

## TEACHING EXPERIENCE (TECHNICAL CLASSES)

Al-Quds Open University (Ramallah) (2004)

**Courses:** Sql and PL-Sql programming (Oracle Database).

## RESEARCH AND PUBLICATIONS

### Research Interests:

My research focuses on viral genome assembly and cancer disease. In viral genome assembly, my research project is devoted to assembling and frequency estimation of viral quasispecies from 454 pyrosequencing shotgun reads which can help estimate outcome of treatment for the infected host and minimize side effects, develop more efficient therapy or drug targeting particular quasispecies in vivo, and understand mechanisms of viral evolution and persistence. I worked on a pipeline for accurate reconstruction of Infectious Bronchitis Virus (IBV) quasispecies sequences and estimating their frequencies from Next Generation Sequencing (NGS) data collected from infected chickens from commercial poultry farms. In the cancer disease project, I did a comprehensive genomic, bioinformatics analysis, to predict new peptides of mouse cancers, previously un-identified by T cell analyses, which could elicit protection from tumor growth, and gives new opportunities, and areas of caution, in the exploration of immunological therapies for cancer.

### Publications

My Research is multidisciplinary where statistical and graph theoretic algorithms, data structures and optimization methods are applied to solve the quasispecies inference problem. Below is a list of my publications:

- Sabbah, Yousef, **Tork, Bassam**, Eleyan, Derar. "A Proposed Web Application for Quality Improvement of Academic Programs in Higher Education Institutions (HEIs)". Accepted in the Palestinian Journal of Technology and Applied Sciences (PJTAS) 1(2), 2018.
- **Tork, B.**, Nenastyeva E., Artyomenko A., Mancuso, N., I.Khan, M., O'Neill, R., Mandoiu, I., and Zelikovsky, A. "Reconstruction of Infectious Bronchitis Virus Quasispecies from NGS Data". 9th International Symposium on Bioinformatics Research and Applications - ISBRA 2013.
- Mancuso\* , Nick, **Tork\*** , **Bassam**, Skums, Pavel, Ganova-Raeva, Lilia, Mandoiu, Ion, and Zelikovsky, Aleksandr, "Reconstructing Viral Quasispecies from NGS Amplicon Reads". In Silico (2012).  
\*: contributed equally.
- Astrovskaya, Irina, **Tork, Bassam**, Mangul, Serghei, Westbrooks, Kelly, Mndoiu, Ion, Balfe, Peter, and Zelikovsky, Aleksandr. "Inferring viral quasispecies spectra from 454 pyrosequencing reads". BMC Bioinformatics 12, Suppl 6 (2011), S1.
- Pavel Skums, Nicholas Mancuso, Alexander Artyomenko, **Bassam Tork**, Ion Mandoiu, Yury Khudyakov, Alex Zelikovsky, "Reconstruction of Viral Population Structure from Next-Generation Sequencing Data Using Multicommodity Flows", ISBRA(2012).
- Mangul, Serghei, Astrovskaya, Irina, Nicolae, Marius, **Tork, Bassam**, Mandoiu, Ion, and Zelikovsky, Aleksander. "Maximum likelihood estimation of incomplete genomic spectrum from hts data". In Proceedings of the 11th International Conference on Algorithms in Bioinformatics (Berlin, Heidelberg, 2011), WABI'11, Springer-Verlag, pp. 213-224.
- Mancuso, Nick, **Tork, Bassam**, Skums, Pavel, Mandoiu, Ion, and Zelikovsky, Aleksander, "Viral Quasispecies Reconstruction from Amplicon 454 Pyrosequencing Reads". In Proc. 1st Workshop on Computational Advances in Molecular Epidemiology (November 12, 2011), pp.94-101.
- Nicholas Mancuso, **Bassam Tork**, Pavel Skums, Ion Mandoiu and Alex Zelikovsky "Multi-Commodity Flow Methods for Quasispecies Spectrum Reconstruction Given Amplicon Reads", 8th International Symposium on Bioinformatics Research and Applications, 2012.
- N. Mancuso, **B. Tork**, P. Skums, L. Ganova-Raeva, I.I. Mandoiu, A. Zelikovsky Workshop: A Maximum Likelihood Method for Quasispecies Spectrum Assembly Proc. 2nd Workshop on Computational Advances for Next Generation Sequencing (CANGS 2012).

### BOOK CHAPTERS

- B. Tork, E. Nenastyeva, A. Artyomenko, N. Mancuso, M. I. Khan, R. O'Neill, I. I. Mandoiu, and A. Zelikovsky, "Reconstruction of Infectious Bronchitis Virus Quasispecies from NGS Data," In I.I. Mandoiu and A.Z. Zelikovsky, editors, Computational Methods for Next Generation Sequencing Data Analysis, Wiley, 2016, pp. 383-400.  
<http://onlinelibrary.wiley.com/book/10.1002/9781119272182>

- Astrovskaya, I., Mancuso, N., **Tork, B.**, Mangul, S., Artyomenko, A., Skums P., Ganova-Raeva, L., Mandoiu, I., and Zelikovsky A. "Inferring Viral Quasispecies Spectra from Shotgun and Amplicon Next-Generation Sequencing Reads", In Maria Poptsova, Genome Analysis: Current Procedures and Applications, Horizon Scientific Press, 2013.

## PROFESSIONAL AND CONFERENCE PRESENTATIONS

- **Invited Talk**, "Reconstruction of Infectious Bronchitis Virus Quasispecies from NGS Data". 9th International Symposium on Bioinformatics Research and Applications - ISBRA 2013.
- **Invited talk**, "Bioinformatics Methods for Reconstruction of Infectious Bronchitis Virus Quasispecies from Next Generation Sequencing Data", 11th International Conference on Molecular Epidemiology and Evolutionary Genetics of Infectious Diseases (MEEGID XI), October 30 – November 2, 2012, New Orleans, USA.
- **Invited Talk**, "Multi-Commodity Flow Methods for Quasispecies Spectrum Reconstruction Given Amplicon Reads", ISBRA(2012), Dallas, TX, USA.

## POSTERS

- Mandoiu, M. Khan, R.J. O'Neill, A. Zelikovsky, C. Obergfell, H. Wang, A. Bligh, **B. Tork**, N. Mancuso, "Bioinformatics Tools for Viral Quasispecies Reconstruction from Next-Generation Sequencing Data and Vaccine Optimization", Poster at the USDA NIFA Animal Genetics, Genomics and Breeding Program Annual Investigator Meeting, Jan. 13, 2012.
- Nicholas Mancuso, **Bassam Tork**, Pavel Skums, Ion Mandoiu, and Alex Zelikovsky. Poster: Quasispecies Spectrum Reconstruction using Multi-commodity Flows. In 2012 RECOMB Satellite Workshop on Massively Parallel Sequencing (RECOMB-Seq), 2012.
- Mangul, S., Astrovskaya, I., Nicolae, M., **Tork, B.**, Mandoiu, I., and Zelikovsky, A. "Maximum Likelihood Estimation of Incomplete Genomic Spectrum from HTS Data", Poster at Georgia Life Sciences Summit : Innovation for a Healthier World (2011), Atlanta, GA, USA.
- Mangul, S., Astrovskaya, I., Nicolae, M., **Tork, B.**, Mandoiu, I., and Zelikovsky, A. "Viral Quasispecies Reconstruction Based on Unassembled Frequency Estimation", Poster at 7th International Symposium on Bioinformatics Research and Applications (ISBRA 2011), Changsha, China.
- I. Astrovskaya, **B. Tork**, S. Mangul, I. Mandoiu, P. Balfe and A. Zelikovsky, "VISPA: Viral Spectrum Assembling Method", Poster at 1st IEEE International Conference on computational Advances in Bio and medical Sciences (ICCABS 2011), Orlando, FL, USA, **Best Poster Award\***.
- Astrovskaya, I., **Tork, B.**, Mangul, S., Westbrooks, K., Mandoiu, I., Balfe, P., and Zelikovsky, A. "HCV Quasispecies Spectrum Reconstruction from 454 Pyrosequencing Reads", Poster at Georgia Life Sciences Summit : Innovation for a Healthier World (2010), Atlanta, GA, USA.

## POSTER PRESENTATIONS

- "Maximum Likelihood Estimation of Incomplete Genomic Spectrum from HTS Data", Poster at Georgia Life Sciences Summit : Innovation for a Healthier World (2011), Atlanta, GA, USA.

## PROFESSIONAL EXPERIENCE

**E-Learning**, March, 2015 – ...

Review learning materials for modification

Designing and developing e-learning solutions

Working on Learning Content Management System (LCMS) for indexing and publishing the content

Understanding the style and need of online readers and developing training materials accordingly

**Postdoctoral Research Fellow in University of Connecticut**, Oct, 2013 – March, 2014.

**Graduate Research Assistant and Teaching Assistant in Georgia State University**, Jan, 2007- August, 2013.

**Head of Software Engineering Department and programmer, Al-Quds Open University**, Oct, 2002 – Jan, 2007

- Extensive knowledge and working experience on Software Development Life Cycle (SDLC), Object Oriented Analysis and Design (OOAD)

- Management and leadership of the Software Engineering Department
- Project manager
- Software developer
- Support emergency fixes to production
- Provide project management guidance and support
- Provide standards for system design documentation
- Provide coding and development standards
- Ensure, offer, and provide the proper training for the software development staff
- Assist with the distribution efforts for client facing systems
- Ensure proper coordination and software requirements documentation with internal and external clients
- Ensure customer support issues are quickly and satisfactorily addressed
- Problem resolution coordination
- Work assignments and work flow for the development staff
- Coordinate and communicate with other departments regarding the details of the software development
- Report to my director

**Environment:** Java, Hibernate, HTML, JSP, Servlets, JDBC, Java Script, Struts1, Eclipse, Oracle 10g, Oracle Developer 2000.

**System Analyst and Programmer in Information & Communication Technology Center (ICTC), Al-Quds Open University, Oct, 1998 – Oct, 2002**

- Extensive knowledge and working experience on Software Development Life Cycle (SDLC), Object Oriented Analysis and Design (OOAD)
- Plan, design, develop, and test complex business systems and system modifications
- Develop, test, and manage the integration between different systems
- Resolve defects of a system and other related systems
- Analyzes issues related to application functionality or data to provide solutions
- Answer customer questions and resolve customer support issues
- Creates and maintains documentation for systems, product documentation, and procedures
- Coordinates with appropriate stakeholders to resolve testing issues and validate product corrections and fixes
- Mentors and trains team members or coworkers as required maximizing workplace efficiency
- Proactively support knowledge sharing within the team and across IT
- Performs additional duties as requested

**Environment:** Java, HTML, JSP, Servlets, JDBC, Java Script, Oracle Database, Oracle Developer 2000.

## EXECUTIVE PROGRAMS

**Admission System – Al-Quds Open University**

**Registration System – Al-Quds Open University**

**Employee Affairs System – Al-Quds Open University**

**Supplies and Warehouses System – Al-Quds Open University**

- DB (Oracle Database) for all materials, devices, furniture, computers etc. used by employee.
- Insertion of new items to the database.
- Items given to other department, employee, and student council or impaired will be deducted from its current balance.
- Summary reports.

**Payroll system – Al-Quds Open University**

- Sharing data from Employee Affairs System in Al-Quds Open University like employee degree, step, marital status, number of children, Academic degree etc.
- Creating a record in the database for each employee per month concerning his base salary, wife allowance, child allowance, manager allowance, technical allowance, insurance value, income tax, employee savings, withdrawal amount, borrows amount, ending service days, death deduction, and net salary.
- Different summary & detailed reports

## SERVICES

- Member of the ACM Student Chapter at Georgia State University.
- Member of the IEEE Student Branch at Georgia State University.
- Sub Reviewer for some conferences

## PROFESSIONAL AFFILIATIONS

Molecular Basis of Disease

## REFERENCES

1. **Dr. Alexander Zelikovsky, Professor**  
Georgia State University, Department of Computer Science  
25 Park Place, room 751, Atlanta, GA 30303  
Phone : 404-413-5730 Fax : 404-413-5717  
E-mail : alexz@cs.gsu.edu , alex.zelikovsky@gmail.com
2. **Dr. Yi Pan, Professor**  
Georgia State University, Interim Associate Dean of Arts and Sciences, and Acting Chair of Biology  
25 Park Place, room 744, Atlanta, Ga 30303  
Phone : 404-413-5719 Fax : 404-463-9912  
E-mail : pan@cs.gsu.edu , yipan@gsu.edu
3. **Dr. Raj Sunderraman, Professor and Acting Chair**  
Georgia State University, Department of Computer Science  
25 Park Place, Room 724, Atlanta, GA 30303  
Phone : 404- 413-5726 Fax : 404-413- 5717  
E-mail : rsunderraman@gsu.edu, raj@cs.gsu.edu
4. **Dr. Saaid Belkasim, Associate Professor**  
Georgia State University, Department of Computer Science  
25 Park Place, room 745, Atlanta, GA 30303  
Phone : 404- 413-5728 Fax : 404-413- 5717  
E-mail : sbelkasim@gsu.edu, sbelkasim@cs.gsu.edu
5. **Dr. Xiaolin Hu, Associate Professor**  
Georgia State University, Department of Computer Science  
25 Park Place, room 746, Atlanta, GA 30303  
Phone : 404- 413- 5716 Fax : 404-413- 5717  
E-mail : xhu@gsu.edu ,xhu@cs.gsu.edu
6. **Louis Henry, Instructor**  
Georgia State University, Department of Computer Science  
25 Park Place, room 740, Atlanta, GA 30303  
Phone : 404- 413- 5744 Fax : 404-413- 5717  
E-mail : lhenry@cs.gsu.edu, lhenry23@gsu.edu
7. **Dr.Eng. Imad Hodali, President Assistant for ICT and Multimedia Production Affairs and Director of ICTC**  
Al-Quds Open University (QOU)  
Ramallah – Jerusalem, Palestinian Authority  
Tel:+970-2 2973703  
Fax:+970-2 2964995  
Cell:+970-599 298525  
Http://www.qou.edu  
E-mail: ihodali@qou.edu
8. **Eng.Saada Shalabi, Information and Communication Technology Center (ICTC) Director Assistant**  
Al-Quds Open University (QOU)  
Ramallah – Jerusalem, Palestinian Authority  
Tel:+970-22964571/2/3/4  
Ext:137  
Cell:+970-598956111  
Http://www.qou.edu

E-mail: [sshalabi@qou.edu](mailto:sshalabi@qou.edu)