Hyundoo Jeong

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CURRENT POSITION	**Chosun University**, Gwangju, South Korea
	Assistant professor, Electronic Engineering — Sept. 2018 - Present

EDUCATION & TRAINING

Baylor College of Medicine, Houston, Texas

Postdoctoral research associate — Aug. 2017 - Aug. 2018
- Advisors: Dr. Zhandong Liu and Dr. Joshua M. Shulman

Texas A&M University, College Station, Texas

Ph.D., Electrical and Computer Engineering — Aug. 2017
- Dissertation: *Probabilistic random walk models for comparative network analysis*
- Advisors: Dr. Byung-Jun Yoon and Dr. Xiaoning Qian

Seoul National University, Seoul, South Korea

M.S., Electrical Engineering and Computer Science — Feb. 2009
- Thesis: *Resource allocation for multiuser OFDM relay networks with fairness constraints*
- Advisor: Dr. Jae Hong Lee

Inha University, Incheon, South Korea

B.S., Electronic Engineering — Feb. 2007
Magna Cum Laude (Ranked in 2 out of 199 students)

RESEARCH INTERESTS

Signal processing, machine learning, probabilistic graphical models, bioinformatics, single cell genomics, computational network biology, statistical network analysis, image processing, and large-scale data analysis.

HONORS AND AWARDS

Young Scholar Research Award, Korean Institute of Intelligent Systems — Fall 2018
Travel Grants
- 14th annual MCBIOS conference, Little Rock, AR — Mar. 2017
- NSF supported grant for 3rd CNB-MAC workshop, Seattle, WA — Oct. 2016
- 13th annual MCBIOS conference, Memphis, TN — Mar. 2016
- NSF supported grant for 2nd CNB-MAC workshop, Atlanta, GA — Sept. 2015
- NSF supported grant for XSEDE15 conference, St. Louis, MO — July 2015
- 12th annual MCBIOS conference, Little Rock, AR — Mar. 2015

Scholarship
- Graduate research assistantship, Texas A&M University — Sept. 2013 to Aug. 2017
- $1,000 scholarship with an in-state tuition waive, Texas A&M University — 2012
- Samsung education scholarship — 2008
- BK21 (Brain Korea) research scholarships, National Research Foundation of Korea — 2007, 2008
- Honor scholarships, Inha University — 2001, 2005 and 2006
- English scholarship, Inha University — 2005

Magna Cum Laude, Inha University — 2007

Research Experience	**Jan and Dan Duncan Neurological Research Institute**	Houston, TX
	Postdoctoral Research Associate	Aug. 2017 to Aug. 2018

- Developing single cell RNA sequencing deconvolution methods
- Developing an imputation method for single cell RNA-seq.
- Developing single cell embedding and 3D geometry reconstruction algorithms

Genomic Signal Processing Lab., Texas A&M University   College Station, TX
Research Assistant   Sept. 2013 to Aug. 2017

- Developed novel random walk models to estimate the node-to-node correspondence across different networks (graphs).
- Developed global network alignment algorithms to identify homologous proteins in multiple protein-protein interaction (PPI) networks.
- Developed network querying algorithms to identify the conserved network modules in large-scale PPI networks.
- Analyzed statistical features of biological networks to construct benchmark datasets to assess the performance of network alignment and querying algorithms.
- Analyzed NGS (next-generation sequencing) data to identify differentially expressed genes with a statistical significance, (target species: *Mus musculus*).

AgriLife Research, Texas A&M University   College Station, TX
Research Assistant   Sept. 2013 to Aug. 2014

- Plant bioinformatics graduate training program
- Performed a downstream analysis for NGS data.
- Developed a quality assessment pipeline for de novo transcriptome assembly for improved gene annotations.

Institute of New Media & Communications   Seoul, South Korea
Research Assistant   Mar. 2007 to Jan. 2009

- Performed research on wireless communications (PHY layer).
- Developed a resource allocation algorithm for multiuser OFDM relay networks.
- Involved projects:
  - Adaptive Resource Allocation for Cooperative Diversity   LG Electronics, 2008
  - Iterative Multiuser Detection for IDMA systems   LG Electronics, 2007
  - Space Time Coded Cooperative Diversity   KOSEF, 2007 to 2008

Work Experience	**Patent Information Promotion Cente**	Seoul, South Korea
	Patent Search Professional	Feb. 2012 to June 2012

- Searched and reviewed technical documents, and made review reports to assess the novelty of the patents.
- Specific areas: IPC H04 (electric communication technique) and G06 (computing; calculating; counting).

Samsung Electronics   Suwon, South Korea
Software Engineer at Mobile Communication Division   Feb. 2009 to Mar. 2011

- Developed smartphone system software for application processor based on Qualcomm Snapdragon chipset.
- Developed Windows phone device drivers: display (LCD and AMOLED), notification, proximity and ambient light sensor.
- Developed test applications to find hardware defectives in the manufacturing process.

Technical Skills	

- Knowledge of signal processing, statistics, machine learning, bioinformatics, and communication theory
- Experienced in high performance computing (Linux CentOS 6, IBM x86 HPC Cluster, PBS/Torque and SLURM)
- Programming languages: Proficient in MATLAB, R, Rcpp, Python, and C/C++
- Bioinformatics tools: DEseq, EdgeR, Trinity, Oases, TopHat, Samtools, and IGV

Journal in Preparation

1. H.-M. Woo[†], **H. Jeong**[†], and B.-J. Yoon "Comprehensive updates in network synthesis models to benchmark comparative network analysis," in preparation. [†]Equally contributed

2. **H. Jeong** and Z. Liu, "PRIME: Probabilistic imputation and smoothing for single cell RNA sequencing," submitted.

3. Y. Wang[†], **H. Jeong**[†], X. Qian, and B.-J Yoon, "ClusterM: a scalable algorithm for computational prediction of conserved protein complexes across multiple protein interaction networks," submitted. [†]Equally contributed

Journal Publications

1. C.-C Chen, **H. Jeong**, X. Qian, and B.-J Yoon, "TOPAS: network-based structural alignment of RNA sequences," Accepted to Bioinformatics.

2. N. Ghaffari[†], O. A. Arshad[†], **H. Jeong**[†], J. Thiltges, M.F. Criscitiello, B.-J. Yoon, A. Datta, and C. D. Johnson, "Examining de novo transcriptome assemblies via a quality assessment pipeline," IEEE/ACM Transaction on Computational Biology and Bioinformatics, vol.15, no.2, pp. 494 - 505, Mar. 2018. [†]Equally contributed

3. **H. Jeong**, X. Qian, and B.-J Yoon, "CUFID-query: random walk based network querying through network flow estimation," BMC Bioinformatics, 18(Suppl. 14):12, 2017.

4. **H. Jeong** and B.-J Yoon, "SEQUOIA: significance enhanced network querying through context-sensitive random walk and minimization of network conductance," BMC Systems Biology, 11(Suppl. 3):20, 2017.

5. **H. Jeong**, X. Qian, and B.-J Yoon, "Effective comparative analysis of protein-protein interaction networks by measuring the steady state network flow using a Markov model," BMC Bioinformatics, 17(Suppl. 13):395, 2016.

6. **H. Jeong** and B.-J Yoon, "Effective estimation of node-to-node correspondence between different graphs," IEEE Signal Processing Letters, vol. 22, no. 6, pp. 661-665, June 2015.

7. **H. Jeong** and B.-J Yoon, "Accurate multiple network alignment through context-sensitive random walk," BMC Systems Biology, 9(Suppl. 1):S7, 2015.

Conference Publications

1. H.-M. Woo[†], **H. Jeong**[†], and B.-J Yoon, "Comprehensive updates in network synthesis models to create an improved benchmark for network alignment algorithms," 9th ACM-BCB, Washington, DC, USA, Aug., 2018. [†]Equally contributed

2. **H. Jeong** and B.-J Yoon, "SEQUOIA: Significance enhanced network querying through context-sensitive random walk and minimization of network conductance," 7th ACM-BCB, Seattle, WA, Oct., 2016.

3. **H. Jeong** and B.-J Yoon, "Identifying molecular complexes in biological networks through context sensitive network querying," 6th ACM-BCB, Atlanta, GA, Sept. 9, 2015.

4. **H. Jeong** and B.-J Yoon, "Accurate multiple network alignment through context-sensitive random walk," Asian Pacific Bioinformatics Conference (APBC) 2015, Hsinchu, Taiwan, Jan. 2015.

5. N. Ghaffari[†], O. A. Arshad[†], **H. Jeong**[†], et al., "De novo transcriptome assemblies and annotation for pacific whiteleg shrimp," IEEE Global Conference on Signal and Information Processing (GlobalSIP) 2014, Atlanta, GA, USA, Dec. 2014. [†]Equally contributed

6. **H. Jeong** and B.-J Yoon, "A novel context-sensitive random walk model for estimating node correspondence between two biological networks," 5th ACM-BCB, Newport Beach, CA, USA, Sept., 2014.

7. **H. Jeong**, J. H. Lee, and H. Seo, "Resource allocation for uplink multiuser OFDM relay networks with fairness constraints," IEEE Vehicular Technology Conference (VTC) 2009 Spring, Barcelona, Spain, Apr. 2009.

Invited Talks

1. **H. Jeong**, "Network-based signal processing in bioinformatics," Korean Institute of Intelligent Systems Fall Conference, Wonju, S. Korea 2018.

Oral & Poster Presentations

1. **H. Jeong**, X. Qian, and B.-J Yoon, "CUFID-query: Accurate network querying through estimation of network flow between query and target networks based on random walk," 14th Annual Conference of the MidSouth Computational Biology and Bioinformatics Society (MCBIOS), Little Rock, AR, USA, Mar. 2017.

2. **H. Jeong**, X. Qian, and B.-J Yoon, "CUFID-multialign: Enhanced multiple alignment of biological networks through estimation of steady-state flow using a random walk model," 14th Annual Conference of the MidSouth Computational Biology and Bioinformatics Society (MCBIOS), Little Rock, AR, USA, Mar. 2017.

3. **H. Jeong** and B.-J Yoon, "SEQUOIA: Significance enhanced network querying through context-sensitive random walk and minimization of network conductance," 3rd Int'l Workshop on Computational Network Biology: Modeling, Analysis, and Control (CNB-MAC), Seattle, WA, USA, Oct. 2016.

4. B.-J Yoon, and **H. Jeong**, "Predicting potential functional module in biological networks through context-sensitive random walk based network querying," Qatar Foundation-Annual Research Conference (QF-ARC), Doha, Qatar, Mar. 2016.

5. **H. Jeong** and B.-J Yoon, "Effective comparative analysis of protein-protein interaction networks by measuring the steady state network flow using a Markov model," 13th Annual Conference of the MidSouth Computational Biology and Bioinformatics Society (MCBIOS), Memphis, TN, USA, Mar. 2016.

6. C.-C Chen, **H. Jeong**, X. Qian, and B.-J Yoon, "Pairwise global structural alignment for RNA sequences through topological networks," 13th Annual Conference of the MidSouth Computational Biology and Bioinformatics Society (MCBIOS), Memphis, TN, USA, Mar. 2016.

7. **H. Jeong** and B.-J. Yoon, "Identifying molecular complexes in biological networks through context sensitive network querying," 2nd Int'l Workshop on Computational Network Biology: Modeling, Analysis, and Control (CNB-MAC), Atlanta, GA, USA, Sep. 2015.

8. **H. Jeong**, O. A. Arshad, N. Ghaffari, J. Thiltges, P. Blood, M. F. Criscitiello, B.-J. Yoon, A. Datta, and C. D. Johnson, "Comparative de novo transcriptome assemblies for Pacific whiteleg shrimp empowered by XSEDE resources," Extreme Science Engineering Discovery Environment (XSEDE), Saint Louis, MO, USA, July. 2015.

9. **H. Jeong** and B.-J Yoon, "Querying networks using context-sensitive random walk," 12th Annual Conference of the MidSouth Computational Biology and Bioinformatics Society (MCBIOS), Little Rock, AR, USA, Mar. 2015.

10. **H. Jeong** and B.-J. Yoon, "A novel context-sensitive random walk model for estimating node correspondence between two biological networks," Int'l Workshop on Computational Network Biology: Modeling, Analysis, and Control (CNB-MAC), Newport Beach, CA, USA, Sep. 2014.

11. **H. Jeong** and B.-J. Yoon, "A novel random walk model for comparing protein interactions networks," IEEE Int'l. Workshop on Genomic Signal Processing and Statistics (GENSIPS) 2013, Houston, TX, USA, Nov. 2013.

PATENTS	1. J. H. Lee and **H. Jeong** et. al "Method of allocating resources for cooperative diversity," 10-1523098, South Korea.

PROFESSIONAL ACTIVITY

Board member, KIIS (Korea Institute of Intelligent Systems)	2019-Present
Board member, KICS (Korea Information and Communications Society)	2019-Present
Member, IEEE (Institute of Electrical and Electronics Engineers)	
Member, ACM (Association for Computing Machinery)	

SERVICE

Reviewer

IEEE/ACM Transactions on Computational Biology and Bioinformatics, PLOS ONE, BMC Bioinformatics, Pattern Recognition Letters, ACM-BCB (2017), EURASIP Journal on Bioinformatics and Systems Biology, Journal of Biological Systems, and Communications for Statistical Applications and Methods.

Other

Korean Student Association at Texas A&M University	2014 - 2017
Student volunteer, XSEDE 2015	2015

TEACHING EXPERIENCE

Fall 2018	Dept. Electronic Engineering, Chosun University

- Electric Circuit 2
- Introduction to Programming (Language: Python)
- Advanced Programming (Language: C)
- Digital Logic Lab.

Last updated: January 11, 2019