

Hyuk Cho**Associate Professor**

Department of Computer Science

College of Science and Engineering Technology

Degrees Earned

Ph.D. in Computer Sciences, The University of Texas at Austin, 2008

M.S. in Computer Sciences, The University of Texas at Austin, 2006

M.A. in Computer Science, Korea University, Korea, 1998

B.E. in Computer Engineering, Chonbuk National University, Korea, 1994

Professional Licensure and Certifications**Peer-Review Publications and Artistic Performances/Exhibitions****Articles**

Seeling, J., Farmer, A., Mansfield, A. Cho, H., and Choudhary, M., (December 2017), Differential Selective Pressures Experienced by the Aurora Kinase Gene Family, *International Journal of Molecular Sciences*, 19(1), pii: E72. doi: 10.3390/ijms19010072.

Koskulu, B., Choudhary, A. , Johnson, H., Cho, H., and Choudhary, M., (February 2017), Identification and Characterization of Replication Origins of Multiple Chromosomes in *Rhobacter sphaeroides*, *Clinical Microbiology*, 6(275). doi: 10.4172/2327-5073.1000275.

An, M.K. and Cho, H., (December 2015), Efficient Data Collection in Interference-Aware Wireless Sensor Networks, Special Issue on Best Papers from CITS 2014, *Journal of Networks*, 10(20), pp.658-667.

Qureshi, O., Cho, H., Choudhary, M., and Seeling, J., (December 2015), A Nonsynonymous/Synonymous Substitution Analysis of the B56 Gene Family Aids in Understanding B56 Isoform Diversity, *PLoS ONE*, 10(12): e0145529, doi:10.1371/journal.pone.0145529.

Mendoza, A., Kumar, A., Midcap, D., Cho, H., and Varol, C., (September 2015), BrowStEx: A Tool to Aggregate Browser Storage Artifacts for Forensic Analysis, *Digital Investigation*, 14, pp.63-75.

Omotajo, D.M., Tate, T., Cho, H., and Choudhary, M., (August 2015), Distribution and Diversity of Ribosome Binding Sites in Prokaryotic Genomes, *BMC Genomics*, 15:404.

Sommer, L., Cho, H., Choudhary, M., and Seeling, J., (May 2015), Evolutionary Analysis of the B56 Gene Family of PP2A Regulatory Subunits, *International Journal of Molecular Sciences*, 16(5), 10134–10157.

Liu, Q., Chen, L., Cho, H., Cooper, P., Li, X., Qiao, M., Su, Y., Wei, M., and Sung A.H., (December 2013), Detection of JPEG Double Compression and Identification of Smartphone Image Source and Post-capture Manipulation, *Applied Intelligence*, 39(4), pp. 705–726.

Thapaliya, D., Myagmarjav, B., Trahan, C., Ortiz, D., Cho, H., and Choudhary, M., (December 2012), Organization, Expression, and Evolution of Flagellar Genes in *Rhodobacter sphaeroides* 2.4.1, *Open Journal of Genetics*, vol., 2. No. 4B, pp. 5–10.

Peters, A., Bavishi, A., Cho, H., and Choudhary, M., (April 2012), Evolutionary Constraints and Gene Expression Analysis of Gene Duplications in *Rhodobacter sphaeroides* 2.4.1, *BMC Research Notes*, 5(1):192.

Bavishi, A., Lin, L., Schroeder K., Peters, A., Cho, H., and Choudhary, M., (December 2010), The Prevalence of Gene Duplications and Their Ancient Origin in *Rhodobacter sphaeroides* 2.4.1, *BMC Microbiology*, 10:331.

Cho, H. and Dhillon, I. S., (September 2008), Co-clustering of Human Cancer Microarrays using Minimum Sum-Squared Residue Co-clustering (MSSRCC) algorithm, *IEEE/ACM Transactions on Computational Biology and Bioinformatics* (IEEE/ACM TCBB), 5(3), pp. 385–400. (**Selected as a featured article**)

Cho, H., Im, Y., Park, J., Moon, J., and Park, D., (December 2001), Design of GBSB-based Neural Associative Memories using Evolution Program, *Journal of Korean Fuzzy Logic and Intelligent System*, vol. 11, no. 7, pp. 0680–0688, December 2001.

Cho, H., Im, Y., Park, J., Moon, J., and Park, D., (June 2001), Design of GBSB Neural Associative Memories using Solution Space Parameterization and Optimization Approach, *International Journal of Fuzzy Logic and Intelligent System*, vol. I, no. 1, pp. 35–43, June 2001.

Park, J., Cho, H., and Park, D., (1999), On the Design of BSB Neural Associative Memories using Semidefinite Programming, *Neural Computation*, vol. 11, pp. 1985–1994.

Park, J. Cho, H., and Park, D., (July 1999), Design of GBSB Neural Associative Memories using Semidefinite Programming, *IEEE Transactions on Neural Networks* (IEEE TNN), vol. 10, no. 4, pp. 946–950.

Books

Chapters

Choudhary, M., Cho, H., Bavish, A., Trahan C., and Myagmarjav, B., (2012), Evolution of Multipartite Genomes in Prokaryotes, *Evolutionary Biology: Mechanisms and Trends*. Also, presented at 15th Meeting at Marseille, France (December 2011).

Proceedings

An, M.K., Cho, H., and Chen, L., (March 2018), Hierarchical Agglomerative Aggregation Scheduling in Directional Wireless Sensor Networks, To appear at IEEE International Conference on Computing, Networking and Communications (ICNC), March 5-8, 2018.

An, M.K., Cho, H., and Chen, L. (August 2017), Hierarchical Agglomerative Aggregation Scheduling in Directional Wireless Sensor Networks, submitted to International Conference on Sensor Networks (ICSN) 2017.

Zhou, B., Cho, H., and Mansfield, A. (June 2017), Robust Sensor Data Fusion through Adaptive Threshold Learning, IEA/AIE 2017.

An, M.K. and Cho, H., (June 2016), Efficient Broadcasting in Wireless Sensor Networks. International Conference on Sensor Networks, ICSN 2016.

An, M.K. and Cho, H., (July 2014), Minimum Latency Data Collection in Interference-Aware Wireless Sensor Networks, International Conference on Computer, Information and Telecommunication Systems, CITS 2014. **(Selected as a best paper)**

Cho, H. and An, M.K., (September 2014), Co-clustering-based Clustering and Segmentation for Pattern Discovery from Time Course Data, ICSIP 2014, International Journal of Information and Electronics Engineering, 4(5), pp. 358–364. **(Selected as a best presentation: Presenter – Dr. An)**

Cho, H. and An, M.K., (September 2014), Co-clustering Algorithm: Batch, Mini-batch, and Online, ICSIP 2014, International Journal of Information and Electronics Engineering, 4(5), pp. 340–346.

Liu, Q., Li, X., Chen, L., Cho, H., Cooper, P.A., Chen, Z., Qiao M., and Sung, A.H., (June 2012), Identification of Smartphone-Image Source and Manipulation, The 25th International Conference on Industrial, Engineering & Other Applications of Applied Intelligent Systems (IEA/AIE), H. Jiang et al. (Eds.): IEA/AIE 2012, LNAI 7345, pp. 262–271.

Cho, H., Mandava, D., Liu, Q., Chen, L., Jeong, S., and Cheng, D., (June 2012), Situation-Aware on Mobile Phone using Co-clustering: Algorithms and Extensions, IEA/AIE 2012, LNAI 7345, pp 272–282.

Cho, H., (June 2010), Data Transformation for Sum Squared Residue, The 14th Pacific-Asia Conference on Knowledge Discovery and Data Mining (PAKDD). M.J.Jaki et al. (Eds.): PAKDD 2010, Part I, LNAI6118, pp.48–55.

Kwon, B. and Cho, H., (May 2010), Scalable Co-clustering Algorithms, The 10th International Conference on Algorithms and Architectures for Parallel Processing (ICA3PP). C.-H. Hsu et al.(Eds.): ICA3PP 2010, Part I, LNCS 6081, pp. 32–43.

Jeong, S., Kalasapur, S., Cheng, D., Song, Gibbs, S., and Cho, H. (December 2009), Clustering and Naïve Bayesian Approaches for Situation-Aware Recommendation on Mobile Devices, IEEE International Conference on Machine Learning and Applications (ICMLA).

Deodhar, M. J., Gupta, G. K., Ghosh, J., Cho, H., and Dhillon, I. S., (June 2009), A Scalable Framework for Discovering Coherent Co-clusters in Noisy Data, IEEE International Conference on Machine Learning (ICML). **(Nominated as a best student paper)**

Deodhar, M. J., Cho, H., Gupta, G. K., Ghosh, J., and Dhillon, I. S., (December 2008), Hunting for Coherent Co-clusters in High Dimensional and Noisy Datasets, IEEE International Conference on

Data Mining (ICDM) (Workshop on Foundations on Data Mining (FDM 2008)). Also, longer version appears as “Robust Overlapping Co-clustering” in UTECE Technical Report IDEAL–TR09.

Cheng, D., Song, H., Cho, H., Jeong, S., Kalasapur, S. and Messer, A., (September 2008), Mobile Situation- aware Task Recommendation Application, IEEE Conference and Exhibition on Next Generation Mobile Applications, Service and Technologies (NGMAST).

Cho, H., Dhillon, I. S., Guan, Y., & Sra. S. (April 2004), Minimum Sum-Squared Residue Co-clustering of Gene Expression Data, Proceedings of the fourth SIAM International Conference on Data Mining, pp. 114–125.

Cho, H., Park, J., and Park, D., (1997), Design of GBSB Neural Networks using LMI, Proceedings of Fall Conference of Korean Institute Intelligent Systems, vol. 7, no. 2, pp. 409–412.

Cho, H., Park, J., and Park, D., (1997), Design of GBSB-based Neural Associative Memories using Evolution Program, Proceedings of Fall Conference of The Korean Institute of Information Scientists and Engineers, vol. 24, no. 2, pp. 389–392.

Cho, H., Park, J., and Park, D., (1996), Design of BSB Neural Networks using Evolution Program, Proceedings of Fall Conference of Korean Institute Intelligent Systems, vol. 6, no. 2, pp. 267–270.

Patents

Jeong, S., Cho, H., Cheng, D., Song, Y., and Kalasapur, S., Situation-Dependent Recommendation based on Clustering (Appl. No.: 12/123,133; Pub. No.: US 2009/0307262 A1; Pub. Date: Dec. 10, 2009)

Cheng, D., Song, Y., Cho, H., Jeong, S., and Kalasapur, S., Determining Situational Patterns of Use for Computing System (Appl. No.: 12/041,389; Pub. No.: US 2009/0055132 A1; Pub. Date: Feb. 26, 2009)

Artistic Performances

Artistic Exhibitions

Research Monographs and Technical Reports

Cho., H., (August 2008), Co-clustering Algorithms: Extensions and Applications, Doctoral Dissertation, The University of Texas at Austin.

Cho, H. & Dhillon, I. S. (2007), Effect of Data Transformation on Co-clustering Algorithms, UTCS Technical Report TR–07–55.

Cho, H., (February 1998), Synthesis of Neural Associative Memories using Qualitative Analysis and LMI Techniques, M.S. Thesis, Korea University.

H. Cho, J. Park, and D. Park, Design of Neural Associative Memories using Qualitative Analysis and Evolution Program, Journal of Science and Technology, Korea University, vol. 14, pp. 203–214, 1996.

Funded External Grants

Presentations/Posters

Gillette, D., Cho, H., and Choudhary, M., (October 19-21, 2017), Evolutionary Analysis of CRISPR System and its Implication on Genome Editing, Fall Meeting of the Texas Branches of ASM, Texas A&M University, College Station, TX 77843. **(2nd Place in poster presentation for undergraduate students)**

Farmer, A., Mansfield, A., Cho, H., and Choudhary, M., (November 10-12, 2016), Evolution of Aurora Kinase Gene Family, Fall Meeting of the Texas Branches of ASM, UT at Dallas, Richardson, TX 75080.

Breuer, M.R., Cho, H., Choudhary, M., and Gaillard, A.R., (November 10-12, 2016), Potential Programmed Cell Death Genes in *Chlamydomonas reinhardtii*, Fall Meeting of the Texas Branches of ASM, UT at Dallas, Richardson, TX 75080. **(2nd Place in poster presentation for graduate students)**

Omotajo, D., Cho, H., and Choudhary, M., (October 29-31, 2015), Statistical Model of Protein Abundance in *Rhodobacter sphaeroides* 2.4.1, Fall Meeting of the Texas Branches of ASM, SHSU, Huntsville, TX 77341.

Sommer, L., Cho, H., Choudhary, M., and Seeling, J., (March 6-8, 2015), Phylogenetic Analysis of the B56 Gene Family of PP2A Regulatory Subunits. Present at 118th Annual Meeting of the Cell and Molecular Biology Section of the Texas Academy of Science.

Carroll, Z., Omotajo, D., Cho, H., and Choudhary, M., (November 6-8, 2014), Identification of Aurora Kinase-like Protein in *Rhodobacter sphaeroides* 2.4.1, Fall Meeting of the Texas Branches of ASM, The University of Texas Health Science Center at Houston, UTHealth Medical School, Houston, Texas 77030.

Choudhary, A., Trahan, C., Cho, H., Azad, R., and Choudhary, M., (November 6-8, 2014), Abundance of Horizontally Transferred Genes in *Rhodobacter sphaeroides*, Fall Meeting of the Texas Branches of ASM, The University of Texas Health Science Center at Houston, UTHealth Medical School, Houston, Texas 77030.

Omotajo, D., Tate, T., Cho, H., and Choudhary, M. (May 17–20, 2014) Genomic Analysis of the Distribution and Diversity of Ribosome Binding Sites in Prokaryotes, The 114th annual general meeting of American Society of Microbiology (ASM), Boston, Massachusetts. (Poster)

Carroll, Z., Omotajo, D., Cho, H., and Choudhary, M. (April 3–5, 2014) Do Prokaryotes have Aurora Kinase function? The ASM-Texas branch meeting, New Braunfels, Texas.

Omotajo, D., Tate, T., Cho, H., and Choudhary, M. (April 3–5, 2014) Genomic Analysis of the Distribution and Diversity of Ribosome Binding Sites in Prokaryotes, The ASM-Texas branch meeting, New Braunfels, Texas. **(Charlie Guantt Award, 2nd Place in oral presentation for graduate students)**

Omotajo, D., Lara, R., Tate, T., Cho, H., and Choudhary, M. (October 31–November 2, 2013) Distribution of Shine-Dalgarno Sequence (SDS) in Prokaryotic Genomes and its possible impact on

translation initiation. The Joint ASM branch meeting – The South Central Branch hosts The Texas branch meeting, New Orleans, Louisiana.

Trahan, C., C., Hyuk, and Choudhary, M. (May 18–21, 2013) Multiple Chromosomes in Bacteria: Low Level of Evolutionary Constraint Drives the Rapid Genetic Divergence of Accessory Chromosomes, The 113th annual general meeting of ASM, Denver, Colorado.

Nguyen, A., Kailash, KC, Cho, H., and Choudhary, M. (April 4–6, 2013) Horizontally-transferred NADH dehydrogenase gene cluster (*nuo1*) is differentially expressed in *Rhodobacter sphaeroides*, The ASM-Texas branch meeting, New Braunfels, Texas.

Omotajo, D., Lara, R., Tate, T., Cho, H., and Choudhary, M. (April 4–6, 2013) Identification of mRNA Lacking Shine-Dalgarno Sequence in *Rhodobacter Sphaeroides*, Presented at the ASM-Texas branch meeting, New Braunfels Texas. (**Orville Wyass Award, 2nd Place in poster presentation for undergraduate students**)

Thapaliya, D., Myagmarjav, B-E., Cho, H., and Choudhary, M. (October 18–20, 2012), Structural Organization and Expression of Flagellar Genes in *Rhodobacter sphaeroides* 2.4.1, Fall Meeting of the Texas Branches of ASM, Baylor University, Waco, Texas.

Kailash, KC, Trahan, C., Cho, H., and Choudhary, M. (October 18–20, 2012), Identification of Frataxin Homolog in *Rhodobacter sphaeroides*, Fall Meeting of the Texas Branches of ASM, Baylor University, Waco, Texas. (**Joan Abramowitz Award, 2nd place in poster presentation for undergraduate students**)

Trahan, C., S. Tanner, K. Ramsey, Cho, H., and Choudhary, M. (March 29–31, 2012), The Evolutionary Accessory Chromosomes in Bacteria: Role of Mutation, Selection, and HGT, Spring Meeting of the Texas Branches of ASM, T Bar and M Resort and Conference Center, New Braunfels, Texas. (**O.B. Williams Award, 2nd place in poster presentation for graduate students**)

Trahan, C., Cho, H., & Choudhary, M. (November 10–12, 2011), A Tale of Two Chromosomes in *Prokaryotes*, Fall Meeting of the Texas Branches of ASM, The University of Texas at Arlington, Texas.

Phillips, P., Bazunu, L., Copeland, J., Cho, H., and Choudhary, M. (November 10–12, 2011), Promoter Analysis of Duplicate Gene-Paris in *Rhodobacter sphaeroides*, Fall Meeting of the Texas Branches of ASM, The University of Texas at Arlington, Texas.

Peters, A., Cho, H. & Choudhary, M. (March 2011), Analysis of Duplicate Genes in *Rhodobacter sphaeroides* 2.4.1, The ASM Texas Branch Meeting at New Braunfels. (**Charlie Gauntt Award, 1st place in oral presentation for graduate students**)

Trahan, C., Cho, H., & Choudhary, M. (October 28–30, 2010), Evolutionary Relationship among Four Strains of *Rhodobacter sphaeroides*, Fall Meeting of the Texas Branches of ASM, Texas State University at San Marcos, Texas.

Peters, A., Cho, H., & Choudhary, M. (October 28–30, 2010), Evolutionary Constraint and Gene Expression Analysis of Duplicate Genes in *Rhodobacter sphaeroides* 2.4.1, Fall Meeting of the Texas Branches of ASM, Texas State University at San Marcos, Texas.

Peters, A., Cho, H., & Choudhary, M. (April 8–10, 2010), Linking Structural and Functional Constraints of Duplicate Genes in *Rhodobacter Sphaeroides*, Spring Meeting of the Texas Branches of ASM, T Bar and M Resort and Conference Center, New Braunfels, Texas.

Peters, A., Lin, L., Harbour, R., Cho, H., & Choudhary, M. (November 5–7, 2009), Functional Constraint and Expression Analysis of Duplicate Genes in *Rhodobacter Sphaeroides*, Fall Meeting of ASM, The University of Texas at Tyler, Texas.

Work or Professional Experiences

2006 – 2008, Assistant Instructor of Computer Sciences (Perl and Python), UT at Austin

2007, Research Intern of Computer Science Lab, SISA, San Jose, CA

1999, Assistant Instructor (C and Assembly Language), Korea University, Korea

Honors and Awards

Awarded “The Faculty Excellence in Research Award,” (August 2017) CoSET, SHSU, 2017.

Selected as the best presentation (July 2014) CITS 2014.

Nominated as a best student paper (June 2009) ICML 2009.

Selected as featured article (September 2008) IEEE/ACM TCBB 2008.

Awards in ASM-Texas branch meeting:

- Joan Abramowitz Award, 2nd place in poster presentation for undergraduate students (October 19–21, 2017)
- O.B. Williams Award, 2nd place in poster presentation for graduate students (November 10–12, 2016)
- Charlie Gauntt Award, 2nd Place in oral presentation for graduate students (April 3–5, 2014)
- Orville Wyass Award, 2nd Place in poster presentation for undergraduate students (April 4–6, 2013)
- Joan Abramowitz Award, 2nd place in poster presentation for undergraduate students (October 18–20, 2012)
- O.B. Williams Award, 2nd place in poster presentation for graduate students (March 29–31, 2012)
- Charlie Gauntt Award, 1st place in oral presentation for graduate students (March 2011)

Other Competencies

Experienced with 15 computer programming languages

Editor, IJMIA (since 2011)