Guadalupe M Canahuate

Curriculum Vitae

Education

8/2004–5/2009	The Ohio State University, Columbus, OH *Ph.D., Computer Science and Engineering*, May 2009
8/2002–12/2003	The Ohio State University, Columbus, OH *M.S., Computer Information Science*, December 2003
8/1996–7/2000	Pontificia Universidad Catolica Madre y Maestra, Dominican Republic *B.S.E., Computer Science*, Summa cum Laude, July 2000

Professional appointments

8/2011–present	Assistant Professor Department of Electrical and Computer Engineering The University of Iowa, Iowa City, IA
7/2010–6/2011	Faculty Department of Computer Science Pontificia Universidad Catolica Madre y Maestra, Dominican Republic
7/2009–6/2010	IT Consultant – Software Developer Argus, SRL Dominican Republic
8/2004–5/2009	Research Assistant Computer Science and Engineering Department The Ohio State University, Columbus, OH
12/2003–7/2004	IT Consultant – Software Developer Laroxxe, SRL Dominican Republic
8/2001–5/2002	Lecturer Department of Computer Science Pontificia Universidad Catolica Madre y Maestra, Dominican Republic
8/2001–5/2002	Senior System Analyst Asystec, S. A. Dominican Republic

4/2000–7/2001	Analyst-Programmer
	Asystec, S. A.
	Dominican Republic

Selected honors and awards

| 2014 | Old Gold Summer Fellowship Award, CoE, University of Iowa |
| 2002 | Fulright-LASPAU Scholarship, Fulbright |

Teaching assignments

ENGR:2730, Computers in Engineering
clickers, robots, and interactive examples on laptops used during class
Fall 2017, Fall 2016, Spring 2016, Fall 2015, Spring 2014, Fall 2013

ECE:3350, Computer Architecture and Organization
Verilog projects
Spring 2015, Spring 2014, Spring 2013, Spring 2012

ECE:5320, High-performance Computer Architecture
Verilog projects
Spring 2017, Spring 2016

ECE:5830, Software Engineering Project
Pivotal Tacker, Git
Spring 2017, Fall 2012, Fall 2011

ECE:5995, Contemporary Topics in ECE *"Big-data: storage, analysis, and algorithms"*
New course, MongoDB, projects
Spring 2015

55:191, Graduate Seminar in Electrical and Computer Engineering
Fall 2014, Fall 2012

Graduate students supervised

1/2012–07/2017	Gheorghi Guzun, PhD 2016
	Currently Assistant Professor at San Jose State University
	PhD Topic: Distributed Indexing and Scalable Query Processing for Interactive Big Data Explorations

| 08/2013-Present | Joel Tosado, post-qualifying exam PhD candidate |
| | *PhD Topic: Modeling outcome response for oropharyngeal head and neck cancer patients* |

8/2011–12/2016	John Tollefson, MS 2016
	Currently Engineer at Rockwell Collins
	MS Topic: Identifying the factors that affect the severity of vehicular crashes by driver age

8/2017–present   Luka Zdilar, Master's student
MS Topic: Ensemble models for outcome risk prediction of head-and-neck cancer patients

Publications

Journal Papers

J1.   MD Anderson Head and Neck Cancer Quantitative Imaging Collaborative Group. "Investigation of radiomics-based signature for local recurrence using primary tumor texture analysis in oropharyngeal head and neck cancer patients: Identification and independent cohort validation using a standardized image feature extraction software", Nature Scientific Reports (accepted for publication)

J2.   Multidisciplinary Larynx Cancer Working Group (Alphabetically: B. Beadle, G. Canahuate, A. El-Naggar, S. Frank, C.D. Fuller, A. Garden, N. Gross, G.B. Gunn, K. Hutcheson, S. Lai, J. Lewin, M. Kies, G.E. Marai, A.S.R. Mohamed, W. Morrison, C. Mulcahy, J. Phan, D. Rosenthal, P. Sevak, T. Sheu, D. Vock, R. Weber, and M. Zafereo) "Conditional Survival Analysis of Patients With Locally Advanced Laryngeal Cancer: Construction of a Dynamic Risk Model and Clinical Nomogram", Nature Scientific Reports 7, 2017 (IF 5.5)

J3.   Elhalawani H, Mohamed ASR , White AL, Zafereo J, Wong AJ, Berends JE, AboHashem S, Williams B, Aymard J, Kanwar A, Perni S, Rock CD, Cooksey L, Campbell S, Ding Y, Lai SY, Marai GE, Vock D, Canahuate GM, Freymann J, Farahani K, Kalpathy-Cramer J, Fuller CD. (2017) *Matched computed tomography segmentation and demographic data for oropharyngeal cancer radiomics challenges.* Nature Scientific Data 4(Article Number 170077): 1-14. (IF 4.29)

J4.   A Kanwar, AS Mohamed, LE Court, L Zhang, GE Marai, G Canahuate, JS Lee, S Perni, JA Messer, BH Pham, B Youssef, D Vock, A Rao, J Kalpathy-Cramer, GB Gunn, DI Rosenthal, CD Fuller, "Development of a Predictive Quantitative Contrast Computed Tomography-Based Feature (Radiomics) Profile for Local Recurrence in Oropharyngeal Cancers", International Journal of Radiation Oncology, Biology, Physics 96(2):S191, 2016 (IF 4.49)

J5.   Guzun, G., Canahuate, G. M. (2016) Hybrid query optimization for hard-to-compress bit-vectors. The Very Large Databases (VLDB) Journal, 25 (3), 339-354.

J6.   Guzun, G., Canahuate, G. M. (2016). Performance evaluation of word-aligned compression. Knowledge and Information Systems (Springer) 48(2), 277-304.

J7.   Guzun, G., Tosado, J., Canahuate, G. M. (2014). Slicing the Dimensionality: Top-k Query Processing for High-DimensionalSpaces. T. Large-Scale Data- and Knowledge-Centered Systems, 14, 26–50.

J8.   Ferhatosmanoglu, N., Allen, T., Canahuate, G. M. (2009). Vector Space Search Engines that Maximizes Expected User Utility. *International Journal of Mathematics in Operational Research, 1,* 279-302.

J9.   Gibas, M., Canahuate, G. M., Ferhatosmanoglu, H. (2008). Online Index Recommendations for High-Dimensional Databases Using Query Workloads. *IEEE Transactions on Knowledge and Data Engineering, 20*(2), 246-260.

J10.   Ferhatosmanoglu, H., Tosun, A. S., Canahuate, G. M., Ramachandran, A. (2006). Efficient Parallel Processing Of Range Queries through Replicated Declustering. *Distributed and Parallel Databases, 20*(2), 117-147.

Conference Proceedings

C1. Guzun, G., Canahuate, G. (2017) "Supporting Dynamic Quantization for High-Dimensional Data Analytics". Proceedings of the ExploreDB'17, ACM SIGMOD.

C2. Guzun, G., McClurg, J., Canahuate, G., Mudumbai, R. (2016) *Power efficient big data analytics algorithms through low-level operations*. IEEE International Conference on Big Data, BIGDATA 2016. (Acceptance Rate: 18.7%)

C3. Tosado, J., Guzun, G., Canahuate, G., Mantilla, R. (2016) *On-demand aggregation of gridded data over user-specified spatio-temporal domains*. 20th International Conference on Advances in Geographic Information Systems, ACM SIGSPATIAL 2016. (Acceptance Rate: 19%)

C4. Canahuate, G. M., Guzun, G., Chiu, D., (2016) *A two-phase mapreduce algorithm for scalable preference queries over high-dimensional data*. 20th International Database Engineering & Applications Symposium, IDEAS 2016 (pp. 43–52). (Acceptance Rate: 15%)

C5. Guzun, G., Tosado, J. E., Canahuate, G. M. (2015). *Scalable preference queries for high-dimensional data using map-reduce*. Big Data (Big Data), 2015 IEEE International Conference on (pp. 2243–2252). (Acceptance Rate: 16.8%)

C6. Slechta, R., Sawin, J., McCamish, B., Chiu, D., Canahuate, G. M. (2014*). Optimizing query execution for variable-aligned length compression of bitmap indices*. 18th International Database Engineering & Applications Symposium, IDEAS 2014 (pp. 217–226). (Acceptance rate: 19.7%)

C7. Guzun, G., Canahuate, G. M., Chiu, D., Sawin, J. (2014). *A Tunable Compression Framework for Bitmap Indices*. ICDE. (Acceptance Rate: 20%)

C8. Chiu, D., Sawin, J., Guzun, G., Canahuate, G. M. (2013). *Dynamic Bitmap Index Recompression through Workload-Based Optimizations* (pp. 95-106). IDEAS. (Acceptance Rate: 21%)

C9. Canahuate, G. M., Apaydin, T., Ferhatosmanoglu, H. (2009). *Secondary bitmap indexes with vertical and horizontal partitioning*. International Conference on Extending Data Base Technology. (Acceptance Rate: 32%)

C10. Apaydin, T., Canahuate, G. M., Ferhatosmanoglu, H., Tosun, A.S (2008). *Dynamic Data Organization for Bitmap Indices*. International ICST Conference on Scalable Information Systems. (Acceptance Rate: 28.5%)

C11. Canahuate, G. M., Gibas, M., Ferhatosmanoglu, H. (2007) *Update Conscious Bitmap Indexes*. International Conference on Scientific and Statistical Database Management.

C12. Apaydin, T., Canahuate, G. M., Ferhatosmanoglu, H., Tosun, A.S (2006). *Approximate Encoding for Direct Access and Query Processing over Compressed Bitmaps* (pp. 846-857). International Conference on Very Large Data Bases. (Acceptance Rate: 13.2%)

C13. Canahuate, G. M., Gibas, M., Ferhatosmanoglu, H. (2006). *Indexing Incomplete Databases* (vol. 3896, pp. 884-901). International Conference on Extending Database Technology - EDBT 2006. (Acceptance Rate: 16%)

Other publications

S1.   H. Elhalawani et al. "Predicting the HPV P16 Status of Oropharyngeal Cancer Patients Using Radiomics and an Ensemble of Random Forests", Radiology Society of North America meeting RSNA 2017 (podium)

S2.   H. Elhalawani et al. "Normal Tissue Radiomic Feature Kinetics in Oropharygeal Cancers Treated with Image-Guided Radiation Therapy: Assessment of Parotid Glands Textural Changes on Daily Non-contrast CT", Radiology Society of North America meeting RSNA 2017

S3.   Kanwar, M.A.S. Radwan, L. Court, J.S. Lee, A. Rao, J. Kalpathy-Cramer, D.Vock, G.E. Marai, G. Canahuate, G.B. Gunn, J. Zhang, C.D. Fuller, "Contrast-enhanced CT (CE-CT) Texture Analysis Radiomic Analysis of Pretreatment Contrast-Enhanced CT Imaging Predicts Local Failure in Oropharyngeal Cancers Treated with Radiotherapy Development of a Predictive Quantitative Contrast CT-based Feature (Radiomics) Feature Profile for Local Recurrence in Oropharyngeal Cancers", pp. 1-2, ASTRO 2016, Sep 2016

S4.   McCamish, B., Zhao, X., Chiu, D., Sawin, J., Canahuate, G. (2015) *"Evaluating work distribution patterns for parallel bitmap compression over SMPs"*. ACM SIGPLAN International Conference on Systems, Programming, Languages and Applications: Software for Humanity, pp. 52-53.

S5.   Canahuate, G., Encarnacion, T., "Binary discretization to improve classification accuracy for early breast cancer detection," IX International and Interdisciplinary Scientific Research Conference (IX CIC), Fondocyt, Dominican Republic. (June 2013). Abstract and presentation.

S6.   Canahuate, G. M., Ferhatosmanoglu, H. (2009). *Bitmap-based indexes.* Encyclopedia of Database Systems.

S7.   Canahuate, G. M., Apaydin, T., Gibas, M., Ferhatosmanoglu, H. (2005). *Fast Semantic-based Similarity Searches in Text Repositories.* Conference on Using Metadata to Manage Unstructured Text, LexisNexis.

Research support

Current research support

03/2017–03/2020   "SMART-ACT: Spatial Methodologic Approaches for Risk Assessment and Therapeutic Adaptation in Cancer Treatment" National Cancer Institute (NCI), National Institutes of Health (NIH)
Role: Principal Investigator
Budget: $1.12M

09/2017–08/2020   "QuBBD: Precision E-Radiomics for Dynamic Big Head & Neck Cancer" National Institutes of Health (NIH)
Role: Principal Investigator
Budget: $783K

Prior research support

09/2015-09/2016   "QuBBD: Collaborative Research: SMART --- Spatial-nonspatial Multidimensional Adaptive Radiotherapy Treatment" National Science Foundation (NSF)
Role: Principal investigator
Budget: $100K

Proposals under review

08/2018-07/2023   "CAREER: Scalable analytics over sparse high-dimensional data using partial distances" submitted to NSF, July 2017. Role: PI

Invited research talks

- Canahuate, G. M., "High-dimensional data Exploration", CBCB Research Meetings (April 2017)

- Canahuate, G. M., "A Tunable Compression Framework for Bitmap Indices "ECE Graduate Seminar Talk (May 2014)

- Canahuate, G. M., "Binary discretization to improve classification accuracy for early breast cancer detection", IX International and Interdisciplinary Scientific Research Conference (IX CIC), Fondocyt, Dominican Republic. (June 2013).

- Canahuate, G. M., "Secondary bitmap indexes with vertical and horizontal partitioning," DMIG Meetings, W326 PBB. (March 2013).

- Canahuate, G. M., "Large-Scale Data Management on the Cloud", ECE Graduate Seminar Talk (Sept 2011)