

**BYUNGGU YU, Ph.D.**

Department of Computer Science and Information Technology  
University of the District of Columbia  
Bldg 42, Room 112C  
4200 Connecticut Ave NW  
Washington, DC 20008

(202) 274-7455

[byu@udc.edu](mailto:byu@udc.edu)

<http://www.cs.uwyo.edu/~yu/>

**EDUCATION**

- 2000**            **Ph.D., Computer Science, Illinois Institute of Technology, Illinois**
- 1991-6            BS&MS, Computer Science, Hangkong University (a.k.a. Korea Aerospace University), South Korea

**POSITION**

- 2007-present**   **Interim Chair, Computer Science and Information Technology, University of the District of Columbia**
- 2007**            **Associate Professor, Computer Science and Information Technology, University of the District of Columbia**
- 2006-2007**      **Associate Professor, Computer Science and Information Systems, National University**
- 2000-2006**      **Assistant Professor, Computer Science, University of Wyoming**
- 1998-1999        Teaching/Research Assistant, Database Systems, Illinois Institute of Technology
- 1995-1997        Researcher, Advanced Traveler Information Systems, Hangkong University and Korea Ministry of Information and Telecommunications
- 1994-1995        Research Assistant, K-2 Airplane Navigation Simulator Project, Hangkong University and Daewoo Heavy Industry

**PUBLICATION**

(Some papers are downloadable at my home page)

**Refereed Special Interest Book and Journal Articles**

Seon Ho Kim, Byunggu Yu, and Jae-young Chang, Zoned-Partitioning of Tree-Like Access Methods, accepted for publication in the *Journal of Information Systems*, Vol. 33, Issue 3, pp. 315-331, 2008, *Elsevier*.

<http://dx.doi.org/10.1016/j.is.2007.11.001>

Byunggu Yu, Seon Ho Kim, and Jaeyoung Chang. An Efficient Storage Technique of Hierarchical Index Structures in Multi-zoned Disk Environments. *Journal of Korea Information Science Society: Database*, Vol. 34, No. 4, pp. 95-107, August 2007.

Byunggu Yu and Thomas Bailey. Processing Partially Specified Queries over High-Dimensional Databases. *DKE Data & Knowledge Engineering*, Vol. 62, Issue 1, pp. 177-197, 2007, *Elsevier*.

<http://dx.doi.org/10.1016/j.datak.2006.08.001>

Byunggu Yu, Thomas Bailey, and Ratko Orlandic. Estimating the Performance of Multidimensional Access Methods based on Non-Overlapping Regions. *IJIS International Journal of Intelligent Systems*, Vol. 22, pp. 1-19, 2007, Wiley.  
doi:10.1002/int.20200

Byunggu Yu and Ruben Gamboa. Designing Spatio-Temporal Portals to Continuously Changing Network Nodes. *Encyclopedia of Portal Technology and Applications*, in press, Idea Group Ref.

Byunggu Yu and Ratko Orlandic. *Chapter XVIII: Indexing Regional Objects in High-Dimensional Spaces. Advanced Topics in Database Research*, Vol. 5, pp. 348-372, 2006, Idea Group Publishing.

Ratko Orlandic and Byunggu Yu. Scalable QSF-Trees: Retrieving Regional Objects in High-Dimensional Spaces. *JDM Journal of Database Management*, Vol. 15, No.3, pp. 45-59, 2005, Idea Group Publishing.

Ratko Orlandic and Byunggu Yu. A Retrieval Technique for High-Dimensional Data and Partially Specified Queries. *DKE Data & Knowledge Engineering*, Vol. 42, No. 1, pp. 1-21, 2002, Elsevier.

Byunggu Yu, Soo Chan Hwang, and Jong Hoo Back. A Spatial Database Search Technique for Moving Reference Objects. *Journal of Institute of Electronics Engineering of Korea*, Vol. 35-C(1), pp. 25-33, ISSN 1226-5853, 1998, IEEK press.

Byunggu Yu and Soo Chan Hwang. A Study of Realtime Database Search Techniques for Moving Objects. *Journal of the EITE Electronics, Information, and Telecommunication Engineering (Korean Journal)*, Vol. 1, No. 2, pp. 161-170, 1995, Hangkong University Press.

**Refereed Special Interest Conference Proceedings (including Springer LNCS and some other Series) with Presentations**

Shayma Alkobaisi, Wan D. Bae, Seon Ho Kim, and Byunggu Yu. MBR Models for Uncertainty Regions of Moving Objects. DASFAA Database Systems for Advanced Applications, LNCS Lecture Notes in Computer Science, accepted as a full paper for publication and for presentation), Springer-Verlag.  
(acceptance rate = 16.7%)

Byunggu Yu, Seon Ho Kim, Shayma Alkobaisi, Wan D. Bae, and Thomas Bailey. The Tornado Model: Uncertainty Model for Continuously Changing Data. DASFAA Database Systems for Advanced Applications, LNCS Lecture Notes in Computer Science, Vol. 4443, pp. 624-636, April 2007, Springer-Verlag.  
(acceptance rate = 70/375=18.7%; graduate advisee)

Byunggu Yu and Seon Ho Kim. Interpolating and Using Most Likely Trajectories in Moving-Objects Databases. DEXA Database and Expert Systems Applications, LNCS Lecture Notes in Computer Science, Vol. 4080, pp. 718-727, 2006, Springer-Verlag.  
(acceptance rate=90/388≈23%)

Byunggu Yu. A Spatiotemporal Uncertainty Model of Degree 1.5 for Continuously Changing Data Objects. Proceedings of ACM SIGAPP SAC, Symposium on Applied Computing, Mobile Computing and Applications, pp. 1150-1155, 2006, ACM.  
(acceptance rate=12/35≈34%)

Byunggu Yu and S.H. Kim. An Efficient Zoning Technique for Multi-Dimensional Access Methods. In: *Proceedings of VLDB Workshop on Trends in Enterprise Application Architecture*, 2005 & In: post-conference *LNCS Lecture Notes in Computer Science*, Vol. 3888, pp. 129-143, 2006, *Springer-Verlag*.  
(acceptance rate=10/38≈26%)

Byunggu Yu. Adaptive query processing in point-transformation schemes. *DEXA Database and Expert Systems Applications*, *LNCS Lecture Notes in Computer Science*, Vol. 3588, pp. 197-206, 2005, *Springer-Verlag*.  
(acceptance rate=92/390≈23%)

Byunggu Yu. A Query System for Spatiotemporal Database Applications. *Proceedings of IEEE 18th Int. Conf. on Systems Engineering*, pp. 28-33, 2005, *IEEE*.

Byunggu Yu, S.D. Prager, and Thomas Bailey. The isosceles-triangle uncertainty model: A spatiotemporal uncertainty model for continuously changing data. *Gold (Eds.), Workshop on Dynamic & Multi-Dimensional GIS, International Society for Photogrammetry and Remote Sensing, Bi-Annual No. XXXVI(2/W29)*, pp. 179-183, 2005, *The International Archives of Photogrammetry, Remote Sensing and Spatial Information Sciences, UK*.  
(bi-annual, 33 selected)

Byunggu Yu, Seonho Kim, Thomas Bailey, and Ruben Gamboa. Curve-Based Representation of Moving Object Trajectories. *Proceedings of IEEE IDEAS International Database Engineering and Applications*, pp. 419-425, 2004, *IEEE*.  
(acceptance rate=30/119≈25% plus 17 short papers)

Bonggi Jun, Bonghee Hong, and Byunggu Yu. Dynamic Splitting Policies of the Adaptive 3DR-tree for Indexing Continuously Moving Objects. *DEXA International Conference on Database and Expert Systems Applications*, *LNCS Lecture Notes in Computer Science*, Vol. 2736, pp. 308-317, 2003, *Springer-Verlag*.  
(acceptance rate=91/236≈39%)

Dong Hyun Kim, Bong Hee Hong, Byunggu Yu, and Eun Suk Hong. Validation-based Reprocessing Scheme for Updating Spatial Data in Mobile Computing Environments. *Proceedings of IEEE AINA International Conference on Advanced Information Networking and Applications*, pp. 211-214, 2003, *IEEE*.  
(2003 acceptance rate is unknown; 2004 acceptance rate was 25%)

Byunggu Yu, Thomas Bailey, Ratko Orlandic, and Jothi Somavaram.  $KDB_{KD}$ -Tree: A Compact  $KDB$ -Tree Structure for Indexing Multidimensional Data. *Proceedings of IEEE ITCC International Conference on Information Technology: Coding and Computing*, pp. 676-680, 2003, *IEEE*.  
(graduate advisee paper)

Ratko Orlandic and Byunggu Yu. Inverted-Space Storage Organization for Persistent Data of Very High Dimensionality. *Proceedings IEEE ITCC International Conference on Information Technology: Coding and Computing*, pp. 616-621, 2001, *IEEE*.

Ratko Orlandic and Byunggu Yu. Implementing  $KDB$ -Trees to Support High-Dimensional Data. *Proceedings of IEEE IDEAS International Database Engineering and Applications Symposium*, 58-67, 2001, *IEEE*.  
(acceptance rate=27/80≈33%)

Byunggu Yu and Ratko Orlandic. Object and Query Transformation: Supporting Multi-Dimensional Queries in Transactional Systems. *Proceedings of ACM CIKM International Conference on Information and Knowledge Management*, pp. 141-149, 2000, *ACM*.

(acceptance rate=66/179≈36%)

Ratko Orlandic and Byunggu Yu. A Study of MBR-Based Spatial Access Methods: How Well They Perform in High-Dimensional Spaces. *Proceedings of IEEE IDEAS International Database Engineering and Applications Symposium*, pp. 306-315, 2000, *IEEE*.  
(acceptance rate=36/90≈40%)

Byunggu Yu, Ratko Orlandic, and Martha Evens. An Efficient and Scalable Spatial Access Method: Simple QSF-trees. *Proceedings ACM CIKM International Conference on Information and Knowledge Management*, pp. 5-14, 1999, *ACM*.  
(acceptance rate= 69/172≈40%)

Byunggu Yu and Martha Evens. Cognitive Issues in Searching Images with Visual Queries. *Proceedings of the SPIE 27th AIPR Advances in Computer-Assisted Recognition, Vol. 3584*, pp. 162-173, 1998, *SPIE*.

### **More Refereed Conference with Presentations**

Pradip Peter Dey, Arun Datta, Mohammad Amin, Thomas Gatton, Alireza Farahani, and Byunggu Yu. A Distributed Preprocessor System. *Proceedings of NCCCIE National Conference on Convergence of Computer and Information Engineering*, in press, *PSG College of Technology, India*.

Byunggu Yu and S.H. Kim. Zoning Multidimensional Access Methods for Analytical Database Applications. *Proceedings of ICCSA Intl. Conf. on Computer Sci. and its Applications*, pp. 191-196, 2005, *US Education*. (acceptance rate=105/298≈35% )

Steven D. Prager and Byunggu Yu. Contextualized Probability for Approximation of Spatiotemporal Data Distribution. *Proceedings of ISAS/CITSA International Joint Conference on Information Systems Analysis and Synthesis and on Cybernetics and Information Technologies, Systems and Applications*, pp. 318-322 (in top 0.1 papers), 2005, *IIS*. (acceptance rate=115/410≈28% )

Byunggu Yu. The Dynamic QSF-Tree: An Access Method for Highly Dynamic Sets of High-Dimensional Regional Objects. *Proceedings of ICCSA Intl. Conf. on Computer Sci. and its Applications*, pp. 267-272, 2003, *US Education*. (acceptance rate=122/193≈63%)

Dehua Zhao, Byunggu Yu, Dan Randolph, and Bong Hee Hong. Relational Geographic Databases. *Proceedings of Systematics, Cybernetics, and Informatics, Vol. VI*, pp. 95-100, 2003, *IIS*. (graduate advisee paper selected as a best paper)

Seong-Do Chi, Young Kwang Kim, Byunggu Yu, S.H. Chae, and G.S. Choi. A Role of Discrete Event Modeling for Advanced Traveler Information Systems. *Proceedings of AIS International Conference on Artificial Intelligence Systems*, pp. 37-43, 1996, *AIS*.

Byunggu Yu and Soo Chan Hwang. A New Dynamic Index Technique for Spatial Data: 2POR-trees. *Proceedings of KISS Korea Information Science Society, Vol. 23, No. 2*, pp. 247-250, 1996, *KISS*.

Seong-Do Chi, Young Kwang Kim, Ja Oak Lee, Byunggu Yu, and T.H. Cho. Using the Modeling and Simulation to Develop the Traffic Route Guidance System. *Proceedings of the MODSIM International Conference on Modeling and Simulation*, pp. 319-324, 1995.

Byunggu Yu. A Realtime Search Mechanism for Continuous Moving Objects in a Spatial Databases. *Proceedings of the 1st Human-Tech Research Paper (Thesis) Competition*, (one of the best 3, Gold Prize), Samsung Elec. Co.

Advisee papers edited by, but not co-authored by, B. Yu: Lawrence Craig Unrein. Processing Multidimensional Ad Hoc Queries over High-Dimensional Databases. *Proceedings of ISAS/CITSA International Joint Conference on Information Systems Analysis and Synthesis and on Cybernetics and Information Technologies, Systems and Applications*, pp. 323-328 (in top 0.1 papers), 2005, *IIS*. (graduate advisee paper)

### **Dissertation**

Byunggu Yu, A Family of Scalable Spatial Access Methods for High-Dimensional Data, Ph.D. Dissertation, Illinois Institute of Technology, Chicago, IL, 2000.

Byunggu Yu, Dynamic Index Techniques for Spatial Databases, M.S. Dissertation, Hangkong University, Korea, 1996.

Byunggu Yu, Realtime Search Techniques for Moving Objects, B.S. Research, Hangkong University, Korea, 1994.

## **PROJECT AND GRANT**

### **Supported Proposals**

Dr. Byunggu Yu, National University Presidential Research Award. 2007.

Dr. Ronald Uhlig (contact person), Dr. Ali Farahani, Dr. Byunggu Yu, Dr. Feodor Vainstein, Dr. Shekar Viswana, Dr. Howard Evans (School Dean), Achieving Compelling Student Comprehension of Complex Information Structures, National University, \$19,000 in cash and \$49,000 in technology for 2007-2008 AY, HP Higher Ed. Grant ID 1896669. Funded.

PI: Dr. Byunggu Yu, Co-PI: Dr. Seon Ho Kim, SPOT-SQL, Sun Microsystems. SPOT-SQL One Phase I: 3 SPOT developer packages w/ 9 SPOTs and three developer software at about \$1,857 and technical support; collaboration with Sun scientists in Java DB and SPOT research. Funded for on-going effort.

PI: Dr. Byunggu Yu, Multi-Layer Spatial Access Methods, Informix Software, Inc., \$222,250.00, 2001 – 2004, Funded.

PI: Dr. Byunggu Yu, Towards Processing Complex Spatial Queries, NSF EPSCoR NSFLOC4304, \$33,028.97, 2001 – 2003, Funded.

PI. Dr. Byunggu Yu, Co-PIs: Dr. Ruben Gamboa and Dr. Thomas Bailey, A Database Server for Moving Object Trajectories, NSF 04-500, IIS, IDM, Rated “Competitive” by NSF panel but will not be funded.

PI: Dr. Byunggu Yu, A Scalable Database Server for Moving Object Trajectories, NSF 02-111, IIS, IDM, Rated “Competitive” by NSF panel but will not be funded.

PI: Dr. Scott Leutenegger, Co-PIs: Mario Lopez, Byunggu Yu, and Seon Ho Kim, A General Database Architecture for Storage and Retrieval of Continuously Changing Data, NSF ITR 2004, \$693,858, Not Funded.

### **Classroom Projects**

(linked on my home page)

GUTS-MO: Geographic Uncertainty Tracking System for Moving Objects

Educational DBMS Project

Educational RGIS Project

### **Past Projects on which I worked as an involved researcher**

1997 to 1998, Lung Scan Database Project, Illinois Institute of Technology and Rush Medical College, Chicago, Illinois: Image Database Design and Implementation for PET-Scans with Informix DBMS. Adaptive Visual Query Processing and Spatial Indexing.

1995 to 1997, Advanced Traveler Information System, Hangkong University and Korean Ministry of Information and Telecommunication, Seoul, South Korea: Traffic Database Server Development with ODBC and Orbix (CORBA). Development of Virtual Driving with Realtime Traffic Information.

1995 to 1997, Office Automation System, Hangkong University, Seoul, South Korea: Application of the techniques, which were developed from Advanced Traffic Information Systems project, for Office Automation.

1994 to 1995, K-2 Airplane Navigation Simulator, Hangkong University and Daewoo Heavy Industry, Seoul, South Korea: Realtime Spatial Database Search Technique.

### **OTHER HONORS AND AWARDS**

National University Presidential Research Award 2007.

Ratko Orlandic and Byunggu Yu, "Scalable QSF-Trees: Retrieving Regional Objects in High-Dimensional Spaces," Journal of Database Management, Ideas Group Publishing Vol. 15, No.3, pp. 45-59, 2004 selected as one of the best JDM papers of the last two years.

One best session paper; One top 0.1 paper; two graduate advisees produced one best session paper and one top 10% paper.

Informix Software, Inc., Informix S/W, Technical Supports, and Training Award, 2001.

1999, Best Student Paper Award, Department of Computer Science, Illinois Institute of Technology, Chicago, IL.

1995/1996, Gold-Prize, 1st Human-Tech Research Paper Competition, Samsung Elec. Co., Seoul, Korea (\$6,000 prize + fully supported M.S. degree & VIP Europe Tour package).

1995/1996, One of the Best B.S. Graduates invited to the President's House by a former President of Korea, Kim, Young-Sam.

### **PROFESSIONAL SERVICE TO THE PUBLIC**

Reviewer, ETRI Journal, 2007

Conference Program Committee Member, LNCS TEAA'06

Conference Program Committee Member, IRMA 2007

Conference Program Committee Member, CITSA'06

Conference Program Committee Member, SOIC'05

External Reviewer, IC06, WMSCI06, IIIS

International Reviewer, JZUS Zhejiang University Science

Conference Program Committee Member, ICCSA'05'06

Invited Session Organizer, ISAS/CITSA 2005, Histograms and Selectivity Estimation in Spatiotemporal Databases

Session Chair, ISAS/CITSA'05

Session Chair, ICCSA'05

Reviewer, ETRI Journal, 2006

Proposal Reviewer, Research Grant Office, City University of Hong Kong 2005-2006

Reviewer, Journal of Intelligent Information Systems (JIIS), Springer, 2005

Book Reviewer,  $\mu$ MPS Project, Thomson Course Technology, Feb., 2005

Reviewer, IRMA'05

Reviewer, PISTA'04 & '05

Reviewer, International Journal for Computers and Their Applications

Additional Reviewer, SCI'03

Secondary Reviewer under Dr. Ratko Orlandic, CS&I'02