

## Asst. Prof. GÜLAY YALÇIN ALKAN

### Personal Information

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### International Researcher IDs

ORCID: 0000-0003-3929-8126

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### Education Information

Doctorate, Universidad Politecnica de Cataluna, Computer Architecture , Spain 2007 - 2014

Postgraduate, Tobb University Of Economics And Technology, Faculty Of Engineering, Bilgisayar Mühendisliği, Turkey 2006 - 2007

Undergraduate, Hacettepe University, Mühendislik Fakültesi, Turkey 1998 - 2003

### Foreign Languages

Spanish, B1 Intermediate

English, C1 Advanced

### Dissertations

Doctorate, Designs for Increasing Reliability While Reducing Energy and Increasing Lifetime, Universidad Politecnica De Cataluna, Computer Architecture , Computer Architecture, 2014

Postgraduate, Mikroişlemcilerde etiket karşılaştırıcılarının kullanılmasıyla geçici hataların tespiti , Tobb Ekonomi Ve Teknoloji Üniversitesi, Mühendislik Fakültesi, Bilgisayar Mhendisliği, 2007

### Research Areas

Computer Sciences, Equipment, Processor Architectures, Engineering and Technology

### Academic Titles / Tasks

Assistant Professor, Abdullah Gul University, Mühendislik Fakültesi, Bilgisayar Mühendisliği, 2018 - Continues

Assistant Professor, Abdullah Gul University, Mühendislik Fakültesi, Bilgisayar Mühendisliği, 2016 - 2018

### Courses

Computer Organization, Undergraduate, 2022 - 2023

Operating Systems, Undergraduate, 2022 - 2023

Computer Architecture, Postgraduate, 2022 - 2023

## Published journal articles indexed by SCI, SSCI, and AHCI

- I. **CompreCity: Accelerating the Travelling Salesman Problem on GPU with data compression**  
Yalçın S., Usul H. B., Yalçın G.  
Integration, pp.1-30, 2024 (SCI-Expanded)
- II. **Energy Trading on a Peer-to-Peer Basis between Virtual Power Plants Using Decentralized Finance Instruments**  
SEVEN S., YOLDAŞ Y., Soran A., YALÇIN ALKAN G., Jung J., Ustun T. S., ÖNEN A.  
SUSTAINABILITY, vol.14, no.20, 2022 (SCI-Expanded)
- III. **A Methodology for Comparing the Reliability of GPU-Based and CPU-Based HPCs**  
Cini N., YALÇIN ALKAN G.  
ACM COMPUTING SURVEYS, vol.53, no.1, 2020 (SCI-Expanded)
- IV. **Exploiting Existing Comparators for Fine-Grained Low-Cost Error Detection**  
Yalçın G., Ergin O., Islek E., UNSAL O. S., CRISTAL A.  
ACM TRANSACTIONS ON ARCHITECTURE AND CODE OPTIMIZATION, vol.11, no.3, pp.233-256, 2014 (SCI-Expanded)
- V. **Bit Impact Factor: Towards making fair vulnerability comparison**  
Can S. Z., Yalçın G., Ergin O., UNSAL O. S., Cristal A.  
Microprocessors and Microsystems, vol.38, no.6, pp.598-604, 2014 (SCI-Expanded)
- VI. **Using tag-match comparators for detecting soft errors**  
Yalçın G., Ergin O.  
IEEE Computer Architecture Letters, vol.6, no.2, 2007 (SCI-Expanded)

## Books

- I. **Transactional Memory for Reliability**  
YALÇIN G., UNSAL O.  
in: Transactional Memory. Foundations, Algorithms, Tools, and Applications, Guerraoui R., Romano P., Editor, Springer International Publishing, İsviçre, pp.268-282, 2015
- II. **Transactional Memory for Reliability**  
YALÇIN G., Unsal O.  
in: Transactional Memory Foundations Algorithms Tools and Applications, Rachid Guerraoui ve Paolo Romano, Editor, Springer, pp.268-282, 2014

## Refereed Congress / Symposium Publications in Proceedings

- I. **Uygulamaların Güvenilirlik Analizi**  
AKTAŞ H., YALÇIN G.  
İşlemci Tasarım Çalıştayı, Turkey, 19 September 2019
- II. **Error Tolerating Methods for Increasing NAND Flash Memory Lifetime**  
YALÇIN G.  
1st WORKSHOP ON TF-X INTEGRATED PROCESSING UNIT TECHNOLOGIES, Turkey, 11 - 13 December 2018
- III. **Designing and Modelling Selective Replication for Fault-tolerant HPC Applications**  
Subasi O., YALÇIN G., Zyulkyarov F., Unsal O., Labarta J.  
17th IEEE/ACM International Symposium on Cluster, Cloud and Grid Computing (CCGRID), Madrid, Spain, 14 - 17 May 2017, pp.452-457

- IV. **A runtime heuristic to selectively replicate tasks for application-specific reliability targets**  
 Subasi O., YALÇIN G., ZYULKYAROV F., UNSAL O., LABARTA J.  
 IEEE International Conference on Cluster Computing (CLUSTER), Taipei, Taiwan, 13 - 15 September 2016, pp.498-505
- V. **CRC Based Memory Reliability for Task Parallel HPC Applications**  
 Subasi O., UNSAL O., LABARTA J., YALÇIN G., CRISTAL A.  
 2016 IEEE International Parallel and Distributed Processing Symposium (IPDPS), Chicago, United States Of America, 23 - 27 May 2016, pp.1101-1112
- VI. **Energy minimization at all layers of the data center The ParaDIME project**  
 PALOMAR O., RETHINAGIRI S. K., YALÇIN G., TITOS R., PRIETO P., TORELLA E., UNSAL O., CRISTAL A., FELBER P., KNAUTH T.  
 Design Automation and Test in Europe, Dresden, Germany, 14 - 18 March 2016, pp.684-689
- VII. **Exploring Energy Reduction in Future Technology Nodes via Voltage Scaling with Application to 10nm**  
 YALÇIN G., Rethinagiri S. K., Palomar O., Unsal O., Cristal A., Milojevic D.  
 2016 24th Euromicro International Conference on Parallel, Distributed, and Network-Based Processing (PDP), Heraklion, Crete, Greece, 17 - 19 February 2016
- VIII. **JSRAM: A circuit-level technique for trading-off robustness and capacity in cache memories**  
 Ahangari H., Yalcin G., Ozturk O., UNSAL O., CRISTAL A.  
 IEEE Computer Society Annual Symposium on VLSI, ISVLSI 2015, Montpellier, France, 8 - 10 July 2015, pp.149-154
- IX. **Flexicache Highly Reliable and Low Power Cache under Supply Voltage Scaling**  
 YALÇIN G., SEYEDI A., UNSAL O., CRISTAL A.  
 Latin American High Performance Computing Conference, Valparaiso, Chile, 20 - 22 October 2014, pp.173-190
- X. **System-level power amp energy estimation methodology and optimization techniques for CPU-GPU based mobile platforms**  
 Rethinagiri S., YALÇIN G., Moreno J. A., Palomar O., Unsal O., Cristal A.  
 2014 IEEE 12th Symposium on Embedded Systems for Real-time Multimedia (ESTIMedia), Greater Noida, India, 16 - 17 October 2014
- XI. **ParaDIME: Parallel Distributed Infrastructure for Minimization of Energy**  
 RETHINAGIRI S. K., PALOMAR O., SOBE A., KNAUTH T., BARCZYNSKI W., Yalcin G., Hayduk Y., CRISTAL A., UNSAL O., FELBER P., et al.  
 17th Euromicro Conference on Digital System Design (DSD), Verona, Italy, 27 - 29 August 2014, pp.191-198
- XII. **Exploiting a fast and simple ECC for scaling supply voltage in level-1 caches**  
 Yalcin G., Islek E., Tozlu O., REVIRIEGO P., Cristal A., UNSAL O. S., Ergin O.  
 20th IEEE International On-Line Testing Symposium, IOLTS 2014, Catalunya, Spain, 7 - 09 July 2014, pp.1-6
- XIII. **Neighbor cell assisted error correction for MLC NAND flash memories**  
 CAI Y., YALÇIN G., MUTLU O., HARATSCH E. F., CRISTAL A., UNSAL O., MAI K.  
 The 2014 ACM international conference on Measurement and modeling of computer systems - SIGMETRICS '14, Texas, United States Of America, 16 - 20 June 2014, pp.491-504
- XIV. **Combining error detection and transactional memory for energy-efficient computing below safe operation margins**  
 Yalcin G., SOBE A., HARMANCI D., VORONIN A., Wamhoff J., FELBER P., UNSAL O., CRISTAL A., FETZER C.  
 2014 22nd Euromicro International Conference on Parallel, Distributed, and Network-Based Processing, PDP 2014, Turin, Italy, 12 - 14 February 2014, pp.248-255
- XV. **Fault tolerance for multi-threaded applications by leveraging hardware transactional memory**  
 Yalcin G., UNSAL O. S., CRISTAL A.  
 2013 ACM International Conference on Computing Frontiers, CF 2013, Ischia, Italy, 14 - 16 May 2013
- XVI. **Circuit design of a novel adaptable and reliable L1 data cache**  
 Seyedi A., Yalcin G., UNSAL O. S., Cristal A.  
 23rd ACM International Conference of the Great Lakes Symposium on VLSI, GLSVLSI 2013, Paris, France, 2 - 03 May 2013, pp.333-334

- XVII. **Fault<sup>TM</sup> Error Detection and Recovery Using Hardware Transactional Memory**  
YALÇIN G., UNSAL O., CRISTAL A.  
Design Automation and Test in Europe, Grenoble, France, 18 - 22 March 2013, pp.220-2205
- XVIII. **Flash correct-and-refresh: Retention-aware error management for increased flash memory lifetime**  
CAI Y., Yalçin G., MUTLU O., HARATSCH E. F., CRISTAL A., UNSAL O. S., MAI K.  
2012 IEEE 30th International Conference on Computer Design, ICCD 2012, Montreal, Canada, 30 September - 03 October 2012, pp.94-101
- XIX. **Symptom<sup>TM</sup>: Symptom-based error detection and recovery using Hardware Transactional Memory**  
Yalçin G., UNSAL O. S., Cristal A., HUR I., VALERO M.  
20th International Conference on Parallel Architectures and Compilation Techniques, PACT 2011, Galveston, TX, United States Of America, 10 - 14 October 2011, pp.199-200
- XX. **FIMSIM A fault injection infrastructure for microarchitectural simulators**  
YALÇIN G., CRISTAL A., UNSAL O., VALERO M.  
2011 IEEE 29th International Conference on Computer Design (ICCD), Boston, United States Of America, 9 - 12 October 2011, pp.431-432

## Scientific Refereeing

Microelectronics Reliability, SCI Journal, April 2016

## Metrics

Publication: 28

Citation (WoS): 99

Citation (Scopus): 154

H-Index (WoS): 3

H-Index (Scopus): 6