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RESEARCH PROFILE	My research interests lie in the intersection of distributed systems, databases and specialized hardware. I explore and combine ideas from these areas in order to overcome the compute/data gap that modern data centers face.
EDUCATION	<div> <b>Ph.D., Computer Science</b> 2013 – 2018  Systems Group, ETH Zürich, Switzerland  Advisor: Prof. Gustavo Alonso </div> <div> <b>M.Sc., Computer Science (Distributed Systems)</b> 2011 – 2013  ETH Zürich, Switzerland </div> <div> <b>B.Sc., Computer Science</b> 2007 – 2011  UTCN Cluj-Napoca, Romania </div>
PROFESSIONAL EXPERIENCE	<div> <b>IMDEA Software Institute</b>, Madrid, ES September 2018 – Present  <i>Assistant Research Professor</i>  Working in the area of distributed systems and hardware acceleration for data processing. </div> <div> <b>IBM Research</b>, Rüschlikon, CH May 2018 – July 2018  <i>Visiting Researcher</i>  Topic: Exploring software and hardware acceleration opportunities for Blockchains. </div> <div> <b>Microsoft Research</b>, Redmond, WA June 2014 – August 2014  <i>Research Intern</i>  Supervisor: Ken Eguro  Topic: Adding support for B-tree indexes and a local cache to the FPGA in Cipherbase. </div> <div> <b>Xilinx Labs</b>, Dublin, Ireland September 2012 – March 2013  <i>Research Intern (Master Thesis)</i>  Supervisor: Michaela Blott  Topic: Design of a hash table for an FPGA-based key-value store optimized for caching scenarios. Helped in overall prototype implementation. </div> <div> <b>INRIA</b>, Sophia-Antipolis, France July 2011 – August 2011  <i>Research Intern (OASIS Group)</i>  Supervisors: Ludovic Henrio and Fabrice Huet  Topic: Annotation-based automatic parallelization of Active Objects in ProActive. </div> <div> <b>INRIA</b>, Sophia-Antipolis, France June 2010 – August 2010  <i>Research Intern (OASIS Group)</i>  Supervisor: Denis Caromel  Topic: Parallel programming and scheduling for multicores in the ProActive Framework </div> <div> <b>MaxIQ Computer</b>, Oradea, Romania 2008 – 2009  <i>Junior Software Engineer</i>  Role: Backend (Java EE) and frontend (HTML, Javascript) developer. </div>

FUNDING AND  
PROJECTS

**ACCORD:** Accelerated Ordering Service for Distributed Ledgers.  
*Marie Curie Individual Fellowship 2018. Ref: EU Project 842956*  
Principal Investigator: Z. István.  
Mentor: M. Hermenegildo.

**BLOQUES-CM:** Intelligent Contracts and Scalable Blockchains and Insurance through Verification and Analysis.  
*Community of Madrid, Call for R&D Activities 2019. Ref.: P2018/TCS-4339*  
Coordinator: J. Caballero (IMDEA Software). Shared grant between UCM, UPM and IMDEA Software.

CONFERENCE  
PUBLICATIONS

**Specialize in Moderation – Building Application-aware Storage Services using FPGAs in the Datacenter.**

L. Kuhring, E. Garcia, Z. István. *11th USENIX Workshop on Hot Topics in Storage and File Systems (HotStorage'19), 2019.*

**Design Patterns for Code Reuse in HLS Packet Processing Pipelines.**

H. Eran, L. Zeno, Z. István, M. Silberstein. *27th IEEE Int'l Symposium on Field-Programmable Custom Computing Machines (FCCM'19), 2019.*

**A Flexible K-Means Operator for Hybrid Databases.**

Z. He, D. Sidler, Z. István, G. Alonso. *International Conference on Field Programmable Logic and Applications (FPL), 2018.*

**Providing Multi-tenant Services with FPGAs: Case Study on a Key-Value Store.** Z. István, G. Alonso, A. Singla. *International Conference on Field Programmable Logic and Applications (FPL), 2018.*

**Accelerating Pattern Matching Queries in Hybrid CPU-FPGA Architectures.**

D. Sidler, Z. István, M. Ewaida, G. Alonso. *ACM SIGMOD/PODS Conference (SIGMOD'17), 2017.*

**Low-Latency TCP/IP Stack for Data Center Applications.**

D. Sidler, Z. István, G. Alonso. *26th Int'l Conference on Field Programmable Logic and Applications (FPL'16), 2016.*

**Runtime Parameterizable Regular Expression Operators for Databases.**

Z. István, D. Sidler, G. Alonso. *24th IEEE Int'l Symposium on Field-Programmable Custom Computing Machines (FCCM'16), 2016*

**Consensus in a Box: Inexpensive Coordination in Hardware**

Z. István, D. Sidler, G. Alonso, M. Vukolic. *13th USENIX Symposium on Networked Systems Design and Implementation (NSDI '16), 2016.*

**Histograms as a Side Effect of Data Movement for Big Data.**

Z. István, L. Woods, G. Alonso. *ACM SIGMOD/PODS Conference (SIGMOD'14), 2014.*

**A Flexible Hash Table Design For 10Gbps Key-value Stores on FPGAs.**

Z. István, G. Alonso, M. Blott, K. Vissers. *23rd Int'l Conference on Field Programmable Logic and Applications (FPL'13), 2013.*

**Achieving 10Gbps Line-rate Key-value Stores with FPGAs.**

M. Blott, K. Karras, L. Liu, K. Vissers, Z. István, J. Bar. *5th USENIX Workshop on Hot Topics in Cloud Computing (HotCloud'13), 2013.*

**Multi-threaded Active Objects.**

L. Henrio, F. Huet, Z. István. *15th Int'l Conference on Coordination models and Languages (COORDINATION), 2013.*

JOURNAL  
PUBLICATIONS

**The Glass Half Full: Using Programmable Hardware Accelerators in Analytics.**  
Z. István. *IEEE Data Engineering Bulletin* March 2019.

**Active Pages 20 Years Later: Active Storage for the Cloud.**  
Z. István, D. Sidler, G. Alonso. *IEEE Internet Computing* July/Aug 2018.

**Caribou: Intelligent Distributed Storage.**  
Z. István, D. Sidler, G. Alonso. *Proceedings of VLDB Endowment, Volume 10, No. 11 (VLDB'17), 2017.*

**A Hash Table for Line Rate Data Processing.**  
Z. István, G. Alonso, M. Blott, K. Vissers. *ACM Transactions on Reconfigurable Technology and Systems (TRETS), March 2015.*

**Ibex – An Intelligent Storage Engine with Support for Advanced SQL Off-loading.**  
L. Woods, Z. István, G. Alonso. *Proceedings of VLDB Endowment, Volume 7, No. 11 (VLDB'14), 2014.*

SHORT PAPERS,  
POSTERS AND  
DEMOS

**Something New Under The Sun: Thoughts on Optimizing the Performance of Blockchains.** Z. István. *The 9th Workshop on Systems for Multi-core and Heterogeneous Architectures (SFMA) at EuroSys'19.*

**StreamChain: Do Blockchains Need Blocks?**  
Z. István, A. Sorniotti, M. Vukolic. *2nd Workshop on Scalable and Resilient Infrastructures for Distributed Ledgers (SERIAL) at Middleware'18.*

**Adapting Active Objects to Multicore Architectures.**  
L. Henrio, F. Huet, Z. István, G. Sebestyen. *Int'l Symposium on Parallel and Distributed Computing (ISPDC 2011), 2011.*

**Enzian: a Research Computer for Datacenter and Rackscale Computing.**  
D. Cock, R. Achermann, M. Owaida, Z. Istvan, T. Grosser, Z. Wang, G. Alonso, T. Roscoe, D. Sidler, A. Turowski. *Poster at EuroSys'18.*

**Caribou: A Platform for Building Smart Storage**  
Z. István, D. Sidler, G. Alonso. *Poster at EuroSys'17.*

**doppioDB: A Hardware Accelerated Database**  
D. Sidler, M. Ewaida, Z. István, K. Kara, G. Alonso. *Demo for SIGMOD'17 and FPL'17.*

**Specialized Microservers for the Data Center**  
Z. István, D. Sidler, G. Alonso. *Demo for FPL'15. Poster at EuroSys'15.*

**Hybrid FPGA-accelerated SQL Query Processing**  
L. Woods, Z. István, G. Alonso. *Demo for FPL'13.*

PATENTS

**Systems and Methods for Providing Distributed Tree Traversal Using Hardware-Based Processing.** K. Eguro, Z. István, A. Arasu, R. Ramamurthy, K. Shriraghav.  
*US 20160147779 A1, Patent application filed 11/26/2014*

SCHOLARSHIPS  
AND AWARDS

**EuroSys Roger Needham PhD Award 2019 – Honorable Mention**  
**ETH Zürich Medal for Doctoral Dissertation 2018**

ETH Zürich Excellence Scholarship for Master's Studies 2011-2013

“Grigore Moisil” National Programming Competition (3rd Place), Romania, 2007

TEACHING EXPERIENCE	<b>Teaching at IMDEA Software</b>	
	Building Data Processing Systems with FPGAs (Seminar at UPM Madrid)	Spring 2019
	Performance Analysis and Modeling of Software Systems (Seminar at UPM)	Fall 2018
	<b>Student Supervision at IMDEA Software</b>	
	Internship: Eva Garcia (UAM, Madrid)	Autumn 2018
	Topic: Porting a benchmarking suite to Hyperledger Fabric	
	Master Thesis: Lucas Kuhring (UPM, Madrid)	Spring 2019
	Topic: Optimizing the performance of Hyperledger Fabric	
	Master Thesis: Srivatsan Lakshmi (UPM, Madrid)	Spring 2019
	Topic: Evaluation of distributed ledger platforms as a replacement for relational databases	
	<b>Teaching Assistant at ETH Zürich</b>	
	Advanced Systems Lab	Fall 2013, Fall 2014, Fall 2015, Fall 2016, Fall 2017
	Data Modeling and Databases	Spring 2016, Spring 2017
	Programmieren und Problemlösen	Spring 2014, Spring 2015
	<b>Student Supervision at ETH Zürich</b>	
	Semester Project: Zhenhao He (co-advised with David Sidler)	Spring 2018
	Topic: A flexible K-Means operator for hybrid databases	
	Bachelor Thesis: Mickey Vanska (co-advised with David Cock)	Spring 2017
	Topic: Program Trace Analysis on an FPGA	
	Bachelor Thesis: Tim Taubner	Spring 2015
COMMUNITY SERVICE	Topic: Accelerating statistical methods using an FPGA	
	Semester Project: Jakub Szymanek	Spring 2014
	Topic: Indexes and caching in IBEX	
	<b>Co-Chair</b> for SERIAL'19 Workshop at Middleware'19, SFMA'19 Workshop at EuroSys'19.	
	<b>PC Member</b> for ASPLOS 2020, EDBT 2020, EuroSys'19 Doctoral Workshop.	
	<b>Reviewer</b> for ACM Journal of Architecture and Code Optimization (TACO) (02.2019), IEEE Transactions on Knowledge and Data Engineering (TKDE) (09.2017), IEEE In- ternational Symposium on Circuits and Systems (ISCAS'18) (external), ACM Journal of Architecture and Code Optimization (TACO) (06.2017).	
	<b>Shadow PC Member</b> for ASPLOS'18, EuroSys'18, EuroSys'17.	
SELECTED INVITED TALKS	About past and future challenges of analytic database acceleration with FPGAs: <i>UCM, Madrid, Spain. May 2019.</i> <i>UPM, Madrid, Spain. June 2019.</i>	
	About Multes and providing multi-tenant services with specialized hardware in the cloud: <i>UAM, Madrid, Spain. October 2018.</i> <i>UPB, Bucharest, Romania. September 2018.</i>	
	About Caribou, an intelligent distributed storage solution: <i>Technion, Haifa, Israel. November 2018</i> <i>IMDEA Software Institute, Madrid, Spain. February 2018</i> <i>KAUST, Thuwal, Saudi Arabia. October 2017</i> <i>TU Dresden, Germany. July 2017</i> <i>Swiss Joint Research Center Workshop, MSR, Cambridge, UK. February 2017</i>	

About inexpensive coordination (consensus) in hardware:

*UTCN Cluj-Napoca, Romania. November 2018*

*IBM Research Rüschlikon, CH. October 2016*

*Xilinx Labs, San Jose, CA. March 2016*

*IBM Research Almaden, San Jose, CA. March 2016*

About accelerating string matching queries with hybrid CPU-FPGA multicores:

*UTCN Cluj-Napoca, Romania. April 2019 Oracle Labs, Belmont, CA. March 2016*

About building specialized microservers:

*University of Washington, Seattle, WA. June 2015*

*Microsoft Research, Redmond, WA. June 2015*

*Oracle Labs Zürich Kickoff Workshop, Zürich, CH. January 2015*

#### LANGUAGES

Hungarian, Romanian, English – Proficient

German, Spanish – Intermediate