

HANGCHEN YU

<http://cs.utexas.edu/~hyu>
yuhc123@gmail.com
+1 (559)-666-4606

RESEARCH INTERESTS

Operating Systems, Distributed Computing & Systems

EDUCATION

- The University of Texas at Austin**, Austin, TX *Aug. 2015 - Present*
Ph.D. student in Computer Science, UTCS Systems group
- Shanghai Jiao Tong University**, Shanghai, China *Sept. 2010 - June 2014*
B.S. in Information Engineering, GPA: Overall 3.75/4.0, Core 3.92/4.0

EXPERIENCE

- Google Inc.**, Madison, WI *May 2016 - Aug. 2016*
Software Engineer Internship in Cloud Storage Team
- Designed, wrote and tested low-level modules in a distributed in-memory storage system (internal production).
- GitCafe, D.G.Z Inc.**, Shanghai, China *Dec. 2014 - June 2015*
Software Developer Internship
- Implemented concurrent pushes of repository to MoPaaS cloud platform and GitCafe pages service (gitcafe.io).
 - Developed GitHub-compatible Markdown rendering engine, wikis/issues modules and reserved keyword manager.
 - Developed task scheduler to achieve workload balance and live patching of git workers.
- Shanghai Jiao Tong University**, Shanghai, China *July 2014 - June 2015*
Research Assistant in Institute of Wireless Communication Technologies
- Implemented graph algorithms such as Shortest Path, MST, Minimum Cut, Maximum Flow on Apache GraphX.
 - Added features to GraphX modules such as GraphLoader, StronglyConnectedComponents and GraphGenerators.

PROJECTS

- Ingens: Coordinated and Efficient Huge Page Management**, Austin, TX *Nov. 2015 - May 2016*
- Implemented Linux page walker to track the access frequency of pages.
 - Optimized performance of Java HotSpot 8 by enabling superpages to different heap generations dynamically.
 - Wrote object aggregation in Redis to allocate frequently accessed objects in continuous memory.
- Compilers**, Austin, TX *Jan. 2016 - Apr. 2016*
- Wrote a recursive descent parser for Bali programming language and SaM (a simple stack machine) code generator.
 - Implemented LLVM passes which analyze and optimize loops by hoisting loop-invariant codes out of the loops.
 - Generated expression trees from LLVM IR and wrote cost-augmented tree grammars using iburg specification.
 - Developed an x86-64 assembly code generator with register allocator for LLVM IR which supports integer arithmetic, arrays, strings, loops, and recursive function calls.
- Operating Systems and Applications**, Austin, TX *Jan. 2016 - Mar. 2016*
- Developed a lightweight x86 kernel with 64-bit long mode and basic memory management module.
 - Built a simple userspace networked file system with FUSE to support transfer, cache and write-back of the files.
 - Developed (ELF) program loaders with all-at-one paging, demand paging and hybrid paging with page prediction.
- Distributed Systems and Applications**, Austin, TX *Oct. 2015 - Nov. 2015*
- Implemented a distributed synchronized playlist based on the Three-Phase-Commit protocol with fault tolerance.
 - Designed a chat room service in the spirit of the multi-decree fault-tolerant Paxos system.
 - Developed an weakly connected consistent key-value store based on Bayou system with session guarantees.
- Social Network Recommendation and Detection**, Shanghai, China *Sept. 2014 - Feb. 2015*
- Loaded LinkedIn network into Neo4j database with Py2neo, displayed it as a force-directed graph with Node.js.
 - Implemented friend recommendation and community detection algorithms with query language Cypher.
- Frequent Subgraph Pattern Mining**, Shanghai, China *Sept. 2014 - Dec. 2014*

- Improved Apriori-based subgraph mining algorithm by breadth-first searching in subgraph lattice.
- Proposed a statistical threshold mechanism to predict frequent subgraphs with few false negatives, improved a filter-and-refinement MapReduce computing model for subgraph mining.

Routing and Congestion Control in SDN, Shanghai, China *June 2014 - Sept. 2014*

- Simulated the network on MiniNet, analyzed the status of switch buffer and triggered events.
- Designed routing control protocol based on these events, reduced the congestion and packet loss of the network.

Development of Campus Newsfeed Android Application, Shanghai, China *Jun. 2014 - Sept. 2014*

- Designed the database structure for message storage, co-developed the 1st version of Newsfeed App for the college.
- Tested and optimized the performance of client, message pushing (JPush), and MySQL database.

Low-profile Conformal Antennas Design, Undergraduate Thesis *Dec. 2013 - June 2014*

- Designed three types of low-profile conformal antennas working at 2.4 GHz on CST Microwave Studio.
- Proposed an antenna design algorithm based on Particle Swarm Optimization algorithm, embedded it in CST as macro, used it to design two parasitic-layer antennas working at 2.4 GHz, fabricated and tested the layout.

Sidelobe Suppression Method Design and Realization, Shanghai, China *May 2013 - May 2014*

- Optimized time sequences of Time Modulation Array using PSO algorithm, suppressed sidelobe level by 7 dB.
- Wrote control program of FPGA based on the optimized time sequences, tested and debugged the switch circuit.

Design and Simulation of Data Aggregation & Fitting Algorithm, Shanghai, China *Sept. 2011 - Mar. 2012*

- Designed and implemented data aggregation and fitting algorithm based on Least Squares Support Vector Machine.
- Completed the simulation and verification of the entire theory using MATLAB, optimized the key parameters.

PUBLICATIONS

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- [1] Y. J. Kwon, **H. C. Yu**, S. Peter, C. Rossbach and E. Witchel, “**Coordinated and Efficient Huge Page Management with Ingens**,” in *USENIX Symposium on Operating Systems Design and Implementation (OSDI)*, 2016.
 - [2] C. He, **H. C. Yu**, A. B. Li, X. L. Liang, J. P. Geng and R. H. Jin, “**Sideband Radiation Level Suppression in Time-Modulated Array by Nonuniform Period Modulation**,” in *IEEE Antennas Wirel. Propag. Lett.*, vol.14, no., pp. 606-609, 2015.
 - [3] L. Liu, R. H. Jin, **H. C. Yu**, X. Liang, J. Geng and X. Bai, “**A Compact Ultra-Wideband Power Divider with High Isolation**,” in *IEEE Antennas and Propagation Symposium*, Memphis, TN, USA, July 6-12 2014.
 - [4] Y. X. Liu, C. L. Chen, **H. C. Yu** and X. P. Guan, “**Distortion Analysis for Delay Tolerant Data Collection for High-speed Wireless Sensor and Actor Networks**,” *Intelligent Control and Automation (WCICA), 2012 10th World Congress on*, pp. 4452-4457, July 2012.

TEACHING

<i>CS 329E Data Visualization, UT Austin, Teaching Assistant</i>	<i>Fall 2016</i>
<i>CS 329E Elements of Programming Languages, UT Austin, Teaching Assistant</i>	<i>Spring 2016</i>
<i>CS 331 Algorithms and Complexity, UT Austin, Teaching Assistant</i>	<i>Spring 2016</i>
<i>CS 350C Advanced Computer Architecture, UT Austin, Teaching Assistant</i>	<i>Fall 2015</i>

SPECIALIZED SKILLS

Languages:	Proficient in C/C++, Java, Python, Shell, Ruby, MATLAB, L ^A T _E X Exposure to Go, Perl, C#, Scala, MySQL, MongoDB
Courses:	CS380D Distributed Computing, CS388G Algorithms: Techniques and Theory (2015 Fall) CS380L Advanced Operating Systems, CS380C Compilers (2016 Spring)
Hobbies:	Reading, tennis, table tennis, chess, basketball