

FRANK YUNGFONG TANG

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1162 Pome Ave, Sunnyvale CA 94087

Education

- **Ph.D. Student** (passing all Ph.D. Qualifying Examinations and then I discontinued & moved to SF Bay Area to join Google), Information and Technology School Ph.D. Program, George Mason University, Fairfax, VA (2004-2005): Data Mining and Application, Database Programming for the Web, Design Patterns, Database Principal. **GPA: 3.92**
- **M.S., Computer Science**, Northeastern University, Boston, MA, 1993. **GPA: 3.97**
- **College Diploma, Electronic Engineering**, Ming Hsin University of Science and Technology, Hsin-Chu, Taiwan, summa cum laude, 1987. **GPA: 3.79**

I also took the following courses for personal development:

- **Courses in Computer Science**, Stanford Center for Professional Development, Stanford University. Courses: CS245 Database System Principles (2006), CS109 Introduction to Probability for Computer Scientists (2012). **GPA: 4.0**
- **Graduate Level Course in Computational Linguistic**, Georgetown University, Georgetown, DC. Course: Introduction to Natural Language Processing (2004). **GPA: 4.0**
- **Certificate in Leadership and Management Program for Technical Professionals**, University of California Extension, Santa Cruz, CA (2000)
- **Undergraduate Level Courses**, De Anza College, Cupertino, CA. Courses: Elementary Statistics and Probability, Financial Accounting I and II, Microeconomic, Macroeconomic, Federal Income Tax, Choir, PE, etc. (1996-2013). **GPA: 4.0**
- **Undergraduate Level Courses, Computer Science**, San Jose State University, San Jose, CA: Discrete Math, Linear Algebra, Data Structure and Algorithm (1991). **GPA: 4.0**

Experience

9/2005-Present, Sr. Software Engineer, Google Inc, Mountain View, CA & Shanghai China

Over the last 13 years, I work on many different Google projects, not in particular order: Migration of Segmenters, Google Translate Frontend development, Chrome Translation Integration, Automatic OCR ground truth generation for Asian & contextual script languages, automatic Ads translation and management system, text-to-speech frontend integration, Virtual Keyboard API for 130+ languages/layouts, frontend performance enhancement for shared UI code, Latin transliteration library, Address widget for 240+ countries, Google Books cross language category name matching, Google video internationalization, Terrain data serving subsystem for radio probation tool, etc. I also added GOOGLETRANSLATE() & DETECTLANGUAGE() function to Google Spreadsheet as one of my 20% project. Currently working on implementing ECMA402 internationalization library on v8 JavaScript engine.

3/2003-9/2005, System Architect, AOL Inc, Mountain View CA & Dulles, VA

Led the internationalization engineering service team. Specifies, designs and implements internationalization / localizability features for various AOL projects. Personally focused on Alerts/Reminders project (HTML, JavaScript, CSS, XML, Java, J2EE, Linux, Ant). Oversaw the internationalization of AOL Communicator, Calendar, and Sync projects. Designed and implemented several enhancements for a highly scalable performance statistic gathering system. Enhanced the

Unicode/internationalization AOL service infrastructure by integrating an open source solution. Created requirements for Service Oriented Architecture and Web Service based Quality of Service infrastructure.

5/2000-5/2003, Sr. Technical Manager, Netscape Communication/AOL, Mountain View CA

Promoted to manage the Netscape Client Internationalization & Text Engineering Group. Led development of text and internationalization features for Mozilla/Gecko/Netscape 6.x, 7.x and Micro-browser: Developed the text rendering subsystem on Windows, MacOS X, and Linux platforms, Text layout (Bidirectional text enabling), Character set conversion, character set detection, Keyboard and input method handling, Word and/or line break detection, e-Mail internationalization, Text item collation. Additionally, I managed technical partnerships with companies from different geographic locations, including: Intel for Simplified Chinese features, Sun Microsystems US, Japan and China for Linux PostScript printing, Simplified Chinese features, and UNIX Asian Input Method projects, IBM Texas, Israel and Egypt for Bi-directional text, Arabic and Hebrew text layout/rendering.

12/1999-5/2000, Principal Software Engineer, Netscape Communication, Mountain View CA

Led the development for Netscape Client Text and Internationalization Engineering Group on Mozilla/Netscape 6.0 project. Architected, designed and implemented: Character set converter, Line/Word breaker, Parallel state machine based character set detector, MacOS text rendering system, Character set identification and parser integration, MacOS and Window input method subsystem and text rendering subsystem, Designed character set detector using statistical approach, and directed a colleague on the implementation.

9/1995-12/1999, Sr. Software Engineer, Netscape Communication, Mountain View CA

Worked for Netscape Client Text Engineering Group on the Netscape 1.1-Netscape 6.0 development.

Classic Mozilla- Planned and initialed sub project in the open source community. Finished Ukraine, Vietnamese enabling projects before the project got canceled. Most of the work carried to the new Netscape 6 project. **Netscape 5.0** (aka Java Netscape) [project cancel later] Designed the Locale model and Input Method subsystem in the Java environment. **Netscape 4.0:** Planned and implemented internationalization support for IMAP4. **Netscape 3.0:** Designed and implemented Unicode converter, the enhanced JVM AWT on Mac, Windows and UNIX to render Unicode text. **Netscape 2.0:** Planned and implemented internationalization support for Netscape Email and News reading features. Prototyped Unicode converter. **Netscape 1.1-** Built the French, German, Japanese Mac installer

1993-1995, Software Engineer, Apple Computer, Inc, Cupertino CA

MacOS 9: Designed and implemented MacOS Text Encoding Converter which perform contextual analysis and bi-direction resolution to convert Latin, Japanese, Chinese, Korean, Cyrillic, Thai, Indicis, Arabic, Hebrew encodings. Three US patents granted with colleagues. **Mac in a box:** Designed and implemented multilingual copy and paste facility for the MacOS simulator on HP-UX and Solaris. Maintained and performed MacTCPtest suite.

1/1993-3/1993, Part-time Lecturer, Northeastern University, Boston, MA

Taught undergraduate "Computer Graphics" course.

7/1992-9/1992, Software Intern, Apple Computer, Inc, Cupertino CA

Researched and prototyped the MIME dispatching mechanism on A/UX.

9/1989-8/1991, Assistant Software Engineer, Institute for Information Industry, Taipei, Taiwan, ROC.

Coordinated technical activities for Unix International Taiwan SIG and OSF Taiwan Ad Hoc Group

Reviewed and draft technical proposal for UI-IWG (UNIX International, Internationalization Working Group). Draft SVR4 Localization Guideline. Managed the Chinese UNIX kernel development group to develop Input Method STREAM modules / user level demand process, Display Driver, user level command line utility localization messages and release engineering. Ported Chinese console display driver on x86 base machine from UNIX SVR3.2 driver to SVR4.0 driver. Designed and implemented Chinese input method handling modules for four different input method algorithms. Quality Assurance the 4 bytes wchar_t implementation of CURSES library in UNIX SVR4. Release Engineer for CHINIX project.

1987-1989, Computer Room, Personnel Department, Army Headquarter, ROC Army. Programming Soldier.

Maintained INFORMIX database for ROC Army personnel records. Wrote SQL or ESQL/C program to generate customized report or view. Wrote COBOL program to generate customized report from ROC military database

US Patents

Granted Patents:

- **Bidirectional code converter**, U.S. Patent 5,784,69, issued July 21, 1998.
- **Context-based code converter**, U.S. Patent 5,784,071, issued July 21, 1998.
- **Unicode Converter**, U.S. Patent 5,793,381, issued August 16, 1998.
- **Method and apparatus using a list of <minimum, size, gap, offset> quadruple to encode Unicode characters in an upper/lowercase mapping**, U.S. Patent 6,717,580 B1, issued April 6, 2004
- **Method for generating positive integer number in Hebrew number system**, U.S. Patent 7,024,438 B2, issued April 4, 2006
- **Method for generating positive integer number in Chinese number system**, U.S. Patent 7,058,673 B2, issued June 6, 2006

Pending Application:

- **User interface for translation webpage**, US20130067307A1, March 14, 2013

Conference Papers / Presentations

- Dmitriy Genzel, Ashok C. Popat, Nemanja Spasojevic, Michael Jahr, Andrew Senior, Eugene Ie and Frank Yung-Fong Tang. Translation-Inspired OCR, 11th International Conference on Document Analysis and Recognition (ICDAR 2011), Beijing, China, September 18-21, 2011.
- Frank Yung-Fong Tang, Wenchao Tong, Google APIs for Text Input and Translation, In Proceedings of The Thirty Third International Unicode Conference (IUC33), San Jose, California, October 2009
- Frank Yung-Fong Tang, Felix Sasaki, and Liam Quin, Internationalization Features in XPath, XQuery and XSLT, In Proceedings of The Twenty Ninth International Unicode Conference (IUC29), San Francisco, California, March 2006
- Frank Yung-Fong Tang, Design Patterns and Practical Architectures for Software Internationalization and Unicode Enabling, In Proceedings of The Twenty Eighth International Unicode Conference (IUC28), Orlando Florida, September 2005

- Frank Yung-Fong Tang, Building Globalized Web Applications by using XPath and XQuery, In Proceedings of The Twenty Eighth International Unicode Conference (IUC28), Orlando Florida, September 2005
- Frank Yung-Fong Tang, Software Defect Patterns which Break Text Integrity, In Proceedings of The Twenty Fifth International Unicode Conference (IUC25), Washington DC, March-April 2004
- "Internet technology with Minority Languages" (Minority Languages Text Rendering in Internet Browser) demonstration to Diplomats and Ministers of Information from many countries, 32nd General Conference, Commission V, UNESCO (United Nations Educational, Scientific and Cultural Organization) October, 2003, Paris, France
- Frank Yung-Fong Tang, MacOS X Internationalization Programming, In Proceedings of The Twenty Second International Unicode Conference (IUC22), San Jose, CA, September 2002
- Frank Yung-Fong Tang, Use CSS and XML for International Content, In Proceedings of The Eighteenth International Unicode Conference (IUC18), San Jose, CA, September 2001
- Frank Yung-Fong Tang, List Id Generations, Basic Case Conversions, and Other Text Transformation Algorithms in Mozilla, In Proceedings of The Sixteenth International Unicode Conference (IUC16), San Jose, September 2000
- Frank Yung-Fong Tang, Multilingual Mozilla- Mozilla Language Enabling, International Mac User Group (IMUG), September 17, 1998
- Frank Yung-Fong Tang, Multilingual Mozilla- Mozilla Language Enabling Project, In Proceedings of The Thirteenth International Unicode Conference (IUC13), San Jose, CA, September 1998
- Frank Yung-Fong Tang, International Challenges for Netscape Communicator, In Proceedings of The Eleventh International Unicode Conference (IUC11), San Jose, CA, September, 1997
- Frank Yung-Fong Tang, International Challenges for Netscape Communicator, In Proceedings of The Tenth International Unicode Conference (IUC10), Mainz, Germany, March 10-12, 1997
- Frank Yung-Fong Tang, Implementing Unicode In Netscape Navigator, In Proceedings of The Ninth International Unicode Conference (IUC9), San Jose, CA, September, 1996
- Frank Yung-Fong Tang, CHINIX Chinese Display Subsystem and Input Method Subsystem, Second CHINIX Technical Seminar, 1990, Taipei, Taiwan

Official Google Blog Posts

I authored several official Google Posts in both English and Chinese:

For Official Google Developer Blog

- The Intl.ListFormat API, Mathias Bynens & Frank Yung-Fong Tang, December 2018, <https://developers.google.com/web/updates/2018/12/intl-listformat>

For Official Google Translate Blog (<http://http://googletranslate.blogspot.com>)

- On-screen Keyboards on Google Translate, Frank Yung-Fong Tang, Tuesday, December 14, 2010

For Official Google Doc Blog (<http://http://googledocs.blogspot.com>)

- Translation functions in spreadsheets, Frank Tang, Thursday, October 01, 2009

For Official Google Code Blog (<http://http://googlecode.blogspot.com>)

Introducing the Virtual Keyboard API, Manish Bhargava and Frank Tang, Monday, June 22, 2009

For Official Google China Blog / Google 黑板报 (<http://googlechinablog.com>): In Chinese

- "纽约市政交通管理局提供三十五种语言资讯, 打造城市资讯国际化新里程" (New York Transit Provide Information in 35 Languages- Set the New Standard of Globalization of Public Information), October 27, 2008
- "谷歌翻译帮助国人了解国外最新商业消息" (Google Translate Help (Chinese) People to Understand Buzzy Foreign Business/Product News), October 6, 2008

- "谷歌翻译小工具让你的网站立即升级全球国际化" (Google Translate Gadget Immediately Upgrade Your Web Site to Serve the Global Market), May 29, 2008
- "谷歌翻译帮助全球网民了解四川地震灾情" (Google Translate Help Internet Users Around the World Know Better about the Earthquake in Sichuan), May 27, 2008
- "谷歌中文版机器翻译发布" (Launching Google Translate on google.cn), May 16, 2008
- "如何在您的网站中加入"搜索本站功能" (How to Add "Search in This Site" Functionality to Your Web Site), December 22, 2006

For Official Google Chinese Web Master Blog / 谷歌中文网站管理员博客

(<http://www.googlechinawebmaster.com>). In Chinese:

- "谷歌翻译小工具让你的网站立即升级全球国际化" (Google Translate Gadget Immediately Upgrade Your Web Site to Serve the Global Market), Jun 2, 2008

Awards at Google

- Best Refactoring Award, Chrome Project, Q3 2018
- OC Awards, for Google Translate project, January 8, 2010
- 2009 Engineering & Operations Citizenship Awards, Google EngOps, Feb 2009.
- "Excellent Performance in Q4" Spot Bonus, Q4 2008, Google Greater China
- 2008 STAR PERFORMER, Google Great China: Elected by all Goolgers in Great China, Feb 2009
- 23 Peer Bonuses from various teams

Volunteering

- Board Member, Clash Debate Club, San Jose, Oct 2015 - Sept 2017
- Parent Coach & Cell Group Leader, Clash Debate Club, San Jose, Oct 2014 - June 2017. Several students I coached won tournament champions, first speaker awards in local and national tournaments.
- I judged more than 150 Team Policy debate rounds and more than 70 Parliamentary debate rounds in about 50 official middle and high school debate tournaments, including four national championship.

Certifications

- SUN Certified Enterprise Architect for the Java 2 Platform Enterprise Education Technology Exam, May, 23, 2005, Sun Educational Services.
- SUN Certified Programmer for the Java 2 Platform 1.4, Feb, 15, 2005, Sun Educational Services.