**Karl Tsai**

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| Education |  |
|  | Florida institude of technology melbourne, FLMaster of Science degree in Computer Science, 1988 |
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| Skills | * Ability to deliver fast, high performance and sound solutions to hard problems
* Decades of team and technical leadership for R&D projects
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| Experience |  |
| 2021 - present | Fulfil Solutions inc. redwood city, cA**Senior Principal Software Engineer*** Lead the R&D effort to build a fully automatic grocery fulfillment system
* ***Skills: C++, embedded systems, linux***
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| 2020 - 2021 | barnes group, inc. peabody, MALead System Architect* Lead the R&D effort to build an advanced injection molding machine system
* ***Skills: C/C++, embedded systems, linux, Python, django REST, data modeling, team leadership***
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| 2018 - 2019 | Qinetiq north america waltham, MA**Software Contractor*** Worked on software development for both land based and underwater military robotics
* ***Skills:* C/C++, TMS570, STM32, FreeRTOS, FreeRTOS-Plus-TCP, LWIP, AS4/IOP, bootloader, sensors, motor control**
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| 2018 | Birkshire grey lexington, MA**Senior Principal Robotic Engineer*** Developed warehouse mobile robotics
* ***Skills: C, WiFi, STM32, HAL/LL, FreeRTOS, sensors, motor control, team leadership***
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| 2016 - 2018 | SENBRIDGE CORporation lincoln, MA**Founder/Entrepreneur*** Started up and lead a team to design and develop motor vehicle telematics
* ***Skills: C, C++, MySQL, WiFi, CAN, accelerometer, Bluetooth, GSM, GPS, Android***
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| 2005 - 2016 | Independent consUltant/contractor nationwide* **Zipcar**, Worked on telematics system and software, lead the team, defined system architecture and implemented new features
* **UTC Goodrich**, Worked on system architecture as well as software aspects of the common framework for the next generation sensor product
* **SELF**, Worked on a travel experience capture Android application involving location services, Google-Map, Camera/Gallery, Mediastore, Content Provider/Resolver/Observer, sqlite database, facebook integration, and other interesting areas.
* **Astronautics**, Worked on both software development and verification and validation for Airbus A400M INSU project
* **Corning**, Provided architectural consultation and development effort for a innovative cell network product
* **Wingspeed**, Developed a script-driven communication protocols simulator to test a line of airborne communication systems as per its certification requirements
* **Sunrise Labs**, Provided consultation services to a group of developers on an ARM9, embedded linux-powered medical instrumentation project
* **TAC**, Provided consultation and development work for a building automation system, administered the development system on daily basis
* **AccuTime**, Lead a team to develop time and attendance products with solution built on J2ME/CDC and embedded linux on ARM9 processor
* **ACME Packet**, Developed VOIP simulator for scalability study and testing
* **BinJ Labs**, Architected a RF detection, personnel tracking, and pinpointing system
* **Way Systems**, Worked on Java-centric cellphone-based POS system.
* ***Skills: C, C++, STL, embedded linux, Java CDC, Tcl/CGI, biometrics, device drivers, multi-thread programming, Linux System Admin, UML, Scratchbox, HTML, Javascript, XML/XSLT/XSD, CSS, DO-178B, ARINC 429, 655, DOORS, Fault-Tolerant System, Sqlite, Boost, Android, JQuery, Oracle, PL/SQL, OBD/CAN, Telematics, FreeRTOS, Accelerometer/Gyroscope, BLE, PIC, Cortex M3,NFC***
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| 2001 - 2005 | Savaje technologies chelmsford, MAMember of Technical Staff, Core System Group, Porting Group* Worked on Java-centric smart-phone operating system.
* Architect and lead development on networking subsystem and built multi-network cell-phone implementation with unique routing capabilities.
* Ported PPP and Irda stack.
* Wrote drivers for Li-ion battery pack, flash device (CFI-based for both Intel and AMD), serial comm., LCD display, CDPD modem, USB, SD/MMC, Ethernet, WLAN, I2C, IRDA (inferred), and multimedia controller (MediaQ).
* Lead development of power management for Intel Delhart-based cell-phone.
* Architect and lead development of JSR-135 and JSR-234 multi-media and control functionalities related to camera and wrote drivers for multiple camera-chips (MB86S02A, OV7648, OV9640).
* ***Skills: C, Java, OS internals, smart-phones, drivers, networking, multi-media, power management, Agile/Scrum, embedded system***
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| 1999 - 2001 | vcircles.com, Inc. lincoln, MA* Started up and lead a team from incorporation, writing business plan, seeking angel/venture funding, and eventually developed and deployed an Oracle-backed multi-lingual collaboration web system that connect contents to/from newsgroups and mailing lists and was accessible online for a year.
* ***Skills: C, Java, Tcl, ACS toolkit, email protocol, Usenet, javamail API, Oracle 9i, PL/SQL, data modeling, web servers, Unicode***
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| 1995 - 2002 | Warp 10 corporation lincoln, MAIndependent Consultant/Contractor* Provided software and system contracting/consulting for networking, telecomm, and telephony industries including:
* **Amaroq**, Built and lead a software team for remote meter reading system.
* **Arris**, Worked on MCNS cable modem development, developed algorithm for concatenation to boost performance. Wrote drivers to verify I/O modules for an in-house ASIC chip design
* **Brooktrout Technology**, Designed and developed the voice transport module on their multi-channel telephony board that handles voice, fax, and DTMF between host, MCP and DSP chips.
* **Lanart**, Lead development of a fiber based fast Ethernet switch project.
* **FujitzuNexion**, Developed hardware module id classes to read, write, parse, generate board id chip.
* **Digital Equipment Corporation**, Worked on platform services such as system configuration, upgrade, booting, error evaluation, logging, flash management, hotswap
* **Apec**, Developed a series of medical pumps (model name RoboLab I, II, III)
* ***Skills: C, Java, Tcl, PHP, ACS toolkit, Nucleus+, broadband, drivers, DOCSIS, ASIC verification, power-pc, embedded system, data modeling, Oracle, My-sql, C++, VxWorks, Clearcase***
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| 1992 - 1995 | BBN Systems and technologies, inc. cambridge, MAStaff Software Engineer, Advanced Networking Dept.* Contributed to Government’s ACTS (Advanced Communication Technologies Satellite) HDRT (high data-rate terminal) project. HDRT was a bridge between OC-12 and ACTS.
* Layout the hardware address space, mapped the virtual-physical address translation, designated the order of interrupt priority, designed multi-processor synchronization and handled various other system aspects for this 68040 based multi-processor platform. Wrote bootstrap micro-code, ported and bootstrapped LynxOS RTOS, ported manufacturing diagnostics and POST (Power OnSelf Test) code.
* Developed numerous C++ code in dealing with the HDRT operation such as satellite acquisition, timed data movements (ACTS is TDMA-based system), timing, systems synchronization, and cell switching.
* Developed software glue that feeds an experimental protocol (Hop-Flow) with routing information dynamically obtained from IDPR (Inter-Domain Policy Routing) protocol.
* Developed tools to analyze traffic patterns to facilitate scalability study of 2 distributed military simulation protocols (SIMNET and DIS).
* Extended the functionality of tcpdump to parse an in-house bi-level multicast protocol.
* Developed tools to measure the performance of multicast protocol as part of distributed military simulation projects. Specifically, a multicast traffic generator was developed capable of generating raw packets at precise timing to reproduce any traffic pattern to stress the system. A multicast traffic reception program was developed to measure the effective multicast group join and leave (as proposed in IGMP v2 and v3) time as well as the network performance.
* ***Skills: C, C++, networking protocols, drivers, LynxOS, embedded systems, diagnostics, BSP, 68040, 68HC11, FPGA***
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| 1990 - 1992 | microdyne corporation westford, MASenior Software Engineer, Local Area Network Group* Developed drivers for various Ethernet chips.
* Developed traffic generation and monitoring program to facilitate both hardware and software development as well as manufacturing of various hubs, Ethernet and token ring cards.
* Lead the development of FDDI station management and driver for AMD's FDDI/CDDI (FORMAC+ based) board. Developed board level diagnostics.
* ***Skills: C, Ethernet, FDDI, SMT, drivers, networking protocols, diagnostics, embedded system***
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| 1988 - 1990 | Gtech corporation warwick, riSoftware Engineer, Lottery Terminal Group* Worked on lottery terminal and implemented lotto, number and sports games for Sweden and Indiana State lottery commission.
* Developed multi-lingual support scheme to make GTech's lottery terminal (68000/pSOS) operate in different languages, and different monetary systems.
* Designed a component based system architecture for lottery terminal application with a simple, consistent and extensible interface in connecting the base line and site-specific functionalities.
* ***Skills: C, pSOS, multi-lingual, simulator, embedded system***
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