**CHI-HUNG (JOE) WANG**

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**Software Architect**

A proven problem solver, game changer, innovator and leader in software industry. Strong desire and quickness to learn. A teammate with a can-do attitude, high energy, detail-oriented. Stellar communication skills. Ability and flexibility to work and communicate effectively in a multi-national, multi-time-zone corporate environment. Accomplished five leading software products for two major consolidated IC design automation companies; part of the reasons led into the top three acquisitions in design automation history. Core competencies include:

Data Structures | Computer Algorithms | Object-Oriented Designs| Project Management | Numerical Analysis | Design Automation Software| Computational Software | Business Intelligence | Data Visualization |

Cloud Computing Software Designs | Big Data | Graph/AI/ML Algorithms | Problem Solving

**TECHNICAL SKILLS**

* Front-end |back-end | full-stack: Java | JavaScript | TypeScript | node.js | CSS | React | Spring Rest | Spring Boot | Redux | Redux-saga | C# .NET | HTML | Json | XML | Git/GitHub | IntelliJ | vscode | Gradle | Electron | Selenium | Jasmine | Enzyme | Junit | Docker | Jsoup | CI/CD | Agile under Scrum
* C/C++ | YACC | Python(NumPy, Tensorflow, PyTorch) | Ruby | Matlab | CUDA | Tcl | Skill | csh | bash | perl | awk | boost | Cmake | Perforce | Coverity | Purify | valgrind | asan | ccolab/rbt/code review
* Windows | Mac OS | Linux | Ubuntu
* Internet/network : Client | Server | IPC | TCP/IP | Micro services | REST api | HTTP | HTTPS| gRPC
* Distributed System/Parallel/HPC: Master-slave | LSF | multi-threading | fork | concurrent | SIMD | CUDA | asynchronous | embedded system
* Automation Algorithms: Constrained pre-conditioned large sparse matrix non-linear solver | Computation Geometry | Graph | Poisson equation| Simulated Annealing | static timing | AST/BDD | Place | Route | Floorplan | DRC/LVS | Synthesis | ML solvers, logistic regressions, CNN, RNN, GAN, LLM
* Cloud: SQL/non-SQL | AWS | Kubernetes | Splunk | Cloud Connectors | OAuth
* Data Visualization: Tableau Desktop | Prep builder | Tableau Cloud
* Layout Editor/GUI: QT | QML | OpenGL | OpenCV | TK | MVC | MVVM | widget applications | plugins | undo/redo | push/shove
* IC design files: LEF | DEF | EDIF | SDF | SPEF | CDL | Spice | YAML | Verilog | pdk/ipdk
* EDA logic/physical databases: Cadence CDBA, OpenAccess, Magma Titan, Talus Bedrock, Synopsys Milkyway, Innovus DB, Siemens Parasolid, ACIS modeling, GDSII
* EDA SOC tools/flows: Cadence Genus, Innovus, Quantus, Voltus, Sigrity, Modus, Tempus, Conformal, Virtuoso ADE VXL | Synopsys design compiler, prime time, ICC2, Custom Compiler, Star RC, Mentor Calibre, Scan Chain, JTAG, BSRG, BIST, ATPG

**EXPERIENCE**

**Cadence Design Systems, Inc., Austin, TX September 2022 – June 2024**

**Software Architect**

Worked on the latest Innovus SOC distributed optimization product, which uses multi-threading / multi-machine / master-slave architectures to build a flow that leverages all features in Innovus to optimize SOC designs to satisfy timing / power / area / density / congestion constraints.

* Facilitated debug / analyze / identify issues in complex flows including floor planning, partition, placement, routing, extraction, static timing analysis, cts, buffer insertion, flip-flop merging, density, power analysis, inter-process communication, primarily in TCL / C++ / csh / lsf on Linux grids.
* Learned and fixed key bugs / flow-related issues / performance bottlenecks / inconsistent timing / random crashes / hang-ups that few others can identify. Improved several key components’ performances by more than 30%, reduced the disk space usage by 90%.

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**Salesforce, inc., (Tableau) Austin, TX September 2019 – September 2022**

**Lead Software Engineer,**

Worked on Tableau data prep, security-and-sharing, cloud connector authentication products, applied modern front-end / full-stack technologies in big data / visualization flow using Java / React-JavaScript / TypeScript / Redux / Rest on Electron / IntelliJ platforms.

* + Reduced assigned defects / stories by 100%, created new key features that cover the entire flow and significantly simplified usage model, welcomed by the customers right away. Quickly mastered modern software development skills in client / server / cloud environment.
  + Implemented practical features like auto-updater which can automatically guide users to install the most up-to-date releases in multi-language platforms in a SAAS / cloud environment in a timely manner.
  + Masterful for various software testing / regressions / unit test methodologies like canary tests, Selenium, JUnit, Jsoup; heavily involved in AWS kubernetes / docker and other Cloud platforms.

**Synopsys Design, Inc., Austin, TX April 2007 – July 2019**

**R&D engineer, Senior Staff, Architect (Magma Design, acquired by Synopsys)**

* + Accomplished the Placement Assistant product in Custom Compiler by integrating tools / features / flows from 4 leading companies using state-of-art coding / algorithmic and data flow skills; coded in C++ / Python / YAML / S-expression / TCL / QT to resolve modern placement problems for 7 to 10 nm technologies. Went through 10+ release cycles.
  + Continued to enhance the AVP product that I authored in Magma, evolved it into the core engine for Placement Assistant. Made it adapt to the Helix / Custom Compiler hierarchical design flow. Used threading technology | distributed computing | genetic algorithms to speed the placer by a magnitude of 10X and output multiple optimized solutions in parallel.
* Led teams in India, China and Taiwan to fix bugs and implement sub-features.
* Started from scratch to accomplish a new custom placement platform for Magma Design. Overcame major deficiencies by competitors.
* Invented new ***force-driven/hierarchical sequence pair*** packing algorithms, using mathematical constrained formulas, machine learning techniques, Poisson equations and simulated annealing to simultaneously optimize connectivity and resolve timing/DRC/incremental placement issues with topological constraints for leaf-level devices, rectilinear modules, CMOS PNStacks, standard cells, memory, I/O pins with complex custom/geometrical rules.
  + Invented interactive Constraint-aware editing protocol / core to tightly work with layout editor through QT / TCL / GUI commands / callbacks, reduce overall coding work by more than 80%.

**ADDITIONAL RELEVANT EXPERIENCE**

**Cadence Design Systems, Inc., San Jose, CA August 1995 – April 2007**

**Architect | Senior Software Engineer, (Cooper and Chyan Technology, acquired by Cadence)**

The sole author for Virtuoso VXL/VCP product, beat 5 internal/external teams and become the Custom Placer for Virtuoso. Mentored teams in China/India to implement sub-features and fixing bugs.

**Synopsys, Inc., Mountain View, CA August 1992 – April 1995**

**Senior R&D Engineer,**

Initiated the first Synopsys physical floorplanning/placement tool using fast numerical placer, integrated it with Design Compiler/Prime Time.

* Authored the first fixed-die detailed routing tool for ArcSys(acquired by Synopsys through Avant!), achieved an area-based dynamic/incremental DRC checking system in ArcGate from scratch, which ran 100x faster than the traditional DRC/LVS checking.
* Invented dynamic rip-and-reroute, window-based algorithms to handle routing forests, track connectivity information and improve routing patterns/fix antenna effects in the most efficient ways.

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**LSI Logic Corp., Milpitas, CA August 1990 – April 1992**

**R&D Engineer,**

* Obtained a patent for a Metal Utilization package to solve lonely wire problems in DFM.
* Developed various utilities for IC layout designers, like boundary scan ring placement, placement legalizer in C++; rectilinear hierarchical functional shape editing for top-level floorplans in C++/QT.

**EDUCATION**

**Master of Science, MS, Computer Engineering, Syracuse University, New York,**Member of Tau-Beta-Pi, honor society for international students.

**Bachelor of Science, BS, Computer Engineering, National Chiao-Tung University, Hsin-Chu, Taiwan,**

**INDUSTRY CREDENTIALS**

[Sequence Models](https://www.coursera.org/account/accomplishments/verify/PNHVP3PPF9T7), June 2024

[Convolutional Neural Networks](https://www.coursera.org/account/accomplishments/verify/PNHVP3PPF9T7), June 2024

[Machine Learning](https://www.coursera.org/account/accomplishments/verify/6CKPPWWQLFHG), June 2024

[Neural Networks and Deep Learning](https://coursera.org/share/6a404ef7757716f11931032bd125b587), May 2024

[Improving Deep Neural Networks: Hyperparameter Tuning, Regularization and Optimization](https://www.coursera.org/account/accomplishments/records/DJ46STN9SSJE), May 2024

[Structuring Machine Learning Projects](https://coursera.org/share/65222d8cd36bb79f503098cf3ab8c245), May 2024

Cadence AI in EDA certificate, Sep 2023

Cadence SOC design flow certificate, Dec 2022

Salesforce Amazon AWS EKS certificate, July 2022

https://github.com/princechopin

**PATENTS**

**Patent Number:** 5818729 **Date Issued:** October 6, 1998

**Title of Patent:** Method and system for placing cells using quadratic placement and a spanning tree model

**Patent Number:** 5654897 **Date Issued:** August 5, 1997

**Title of Patent:** Method and structure for improving patterning design for processing