



## Summary

*I have extensive and broad experience in Physical Design Implementation, Flow Development and Methodology and a long history of successful, productized tapeouts, sometimes using [flows that I set up](#). [U.S.Citizen.]*

[www.linkedin.com/in/gurmeet](http://www.linkedin.com/in/gurmeet) |  
[github.com/swiftgurmeet](https://github.com/swiftgurmeet)  
[https://swiftgurmeet.github.io/st/resume\\_gurmeet\\_singh.pdf](https://swiftgurmeet.github.io/st/resume_gurmeet_singh.pdf)

## Experience

### [2022-2024] Intel Foundry Services, Physical Design Methodology Engineer

- Set up and use an implementation (rtl2gds) flow for Intel 18A node using Cadence Flowtool that supports numerous flow, technology, power/performance/area optimization options. This enabled batch jobs with up to thousands of parallel runs with different options, IPs, libraries and metal stacks for regressions or analysis. Started the git repo for the flow and made over 150 commits.
- Worked with Cadence to productize an [Intel18A PPA oriented reference flow](#) usable by customers to jump start their own implementation flows.
- Set up infrastructure for analyzing a large number of Intel18A synthesis/place&route runs on industry standard IPs with Cadence based Genus/Innovus based flow, collect PPA and other QOR metrics and continually document/present them visually using Python-Matplotlib and R-ggplot2.
- Use the above infrastructure to continually improve and benchmark the PPA metrics of industry standard IPs and publish results with different versions of Intel18A libraries and PDKs.
- Worked with Cadence to produce a performance optimized implementation and the associated hierarchical RTL2GDS flow for a high performance ARM core (Cortex-X925 “Blackhawk”) on the Intel18A process.

### [2020-2022] [Samsung Austin Research Center](#), Physical Design Consultant

- Physical implementation (rtl2gds) of 3 large GPU blocks to tapeout [Silicon Success] on a 4nm technology using Cadence Innovus, including floorplanning in SNPS, meeting all area/power/timing requirements. Over 75 timing/DRC ECOs. Provide guidance to the CAD team on methodology.
- PnR flow development in SNPS fusion compiler for 3nm (Samsung 3GAP) technology

### [18-20] [Esperanto Technologies](#), Physical Design Methodology and Global Clocking Engineer

- Defined physical design methodology for 7nm process corners including very low voltage operation and timing margins
- Design of global clock distribution network for a very large 7nm SoC, model the reconvergent network, simulate with spice, implement using ICC2 and resimulate with extracted spice netlist. Publish chip level clock specification document.
- Block level place and route implementation of a million gate low voltage design.
- Set up a Synopsys Custom Compiler schematic and netlisting environment with extracted views. Characterize PVT sensitivity of library cells, esp. level shifters and a ring oscillator with spice simulations and publish results.
- Set up and define methodology for an EM/IR flow using Ansys Redhawk/Seascope
- Support and manage PLL, DLL, DDR, PCIE vendors through weekly meetings.

**[15-17] zGlue Inc, Physical Design Consultant**

- Physical design methodology and netlist-to-gds flow development in tcl using Cadence toolset. Also developed Assura physical verification and logical equivalence (lec) flows.
- Hierarchical implementation of an instance array design including floorplanning, power grid design, pin placement, place and route, logical equivalence and physical verification. [Silicon success.](#)
- Abstract (LEF) generation of analog macros and hierarchical instances to allow for through the block routing.
- Mixed-signal custom CAD support including SKILL programming
- Set up Virtuoso QRC extraction flow for full chip STA, set up and run full chip STA with Tempus, set up and run full chip LEC with Conformal. [Silicon success.](#)

**[13-14] Qualcomm Technologies, Senior Staff Engineer**

- Top level floorplan, power grid design with multiple power domains, using CPF/UPF for a mixed signal design, automated floorplan generation with Tcl. Wrote power intent CPF from scratch. Full chip formal (LEC) and low power (CLP) verification using Cadence tools. Apache Redhawk EM/IR analysis, debug and fixes. My leadership enabled a rare ahead of schedule tapeout. [Silicon success.](#)

**[12-13] Cadence Design Systems, Staff Applications Engineer**

- Developed complete, automated rtl2gds flow (Globalfoundries 14nm/finFET); optimized for PPA and validated on A9 ARM core with Neon coprocessor (TT Nominal @ 2.5 GHz).
- Helped tapeout a DDR IP for a client by doing the final setup/hold/other fixes.

**[2011-12] Sandforce Inc./LSI Corp., Principal Engineer**

- Developed a complete, and deployed, a 40 nm automated and optimized, tapeout ready, Cadence based netlist to tapeout implementation flow at Sandforce Inc.
- Wrote Tcl scripts for a correct by construction, tunable flow used to implement all blocks in the design.
- Developed automated, tapeout ready, STA setup using Primetime-SI using Tcl/Perl scripts.
- Did studies on standard cell EM limits by frequency and flip-flop metastability
- Implemented eight large blocks at tapeout quality using the above flow ; the resulting GDSII were timing, LEC, LVS/DRC clean. [Silicon success.](#)

**[2010-11] Sandisk, Physical Design Contractor**

- Developed hierarchical physical implementation flow in 65nm technology using Cadence at Sandisk.
- Set up 40nm Cadence based, automated, tapeout ready, block level netlist to tapeout implementation flow at Sandisk Inc.

**[2008-10] Qualcomm, Physical Design Consultant**

- 65nm WiFi ASIC: Tapeout implementation of large block using Magma. [Silicon Success.](#)
- 65nm WiFi ASIC: Full chip EM/IR signoff using Apache-Redhawk. [Silicon Success.](#)

**[2007-08] AMCC, Principal Engineer**

- Telecom ASIC: Tapeout implementation of two large blocks using Magma at AMCC. [Silicon Success.](#)
- Set up 65nm Cadence Encounter based block level implementation flow.

**[2006-07] Teranetics, Principal Engineer**

- 130nm/65nm 10GBASE-T PHY ASIC: Implement many large blocks, some using [x-route](#) (diagonal signal routing).
- Automate implementation, static timing analysis, logical equivalence and physical verification flows.
- Power estimation; power reduction using special cells. [Silicon Success.](#)

**[2004-06] Airgo Networks, Physical Design Manager**

- Multiple WiFi ASICs: Implement many blocks using Magma.

