LUDVIK J. KINDL

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ELECTRICAL ENGINEERING PROFESSIONAL

Signal Integrity (SI) Analysis — High-Speed PCBs — Simulations — Timing Analysis — Power Integrity (PI)

High-Speed Clock & Data Distribution — Gigabit Technologies — Analog and RF Circuit Designs

An accomplished electrical engineering professional with 25+ years of experience in a broad range of electrical engineering disciplines. An expert in the design of high-frequency analog & RF circuits and applying that knowledge to the design of high-speed digital PC boards. Experienced in managing engineering teams and all phases of hardware design. Skilled in using signal integrity analysis to ensure quality results. Possesses the latest knowledge in analog and digital technologies, simulations and analytical tools, and testing equipment. Sets high standards that translate into profitable bottom line results.

SUMMARY OF QUALIFICATIONS

- Extensive history in designing **analog & RF** circuits; skilled in applying analog experience to the design of high-speed digital boards, where digital signals behave as analog waveforms, in order to ensure that packages/PCBs/systems work the first time.
- Outstanding track record of building and testing prototype packages/boards/systems on time and within budget.
- **Love to push technological envelop and consult on difficult and very high speed projects.**
- Experienced in managing design projects from feasibility studies and component selection through design, prototype development, and tests.
- **Highly skilled at diagnosing and resolving challenging signal integrity/power integrity problems.**
- **Specializing in < 20 GHz measurements and correlating such measurements to simulations.**
- A seasoned project manager skillful at **motivating multicultural engineering teams to perform to full potential**; able to work in stressful environments and maintain a sense of humor.
- A talented leader able to develop relationships built on mutual trust and respect; a skilled communicator at all organizational levels.
- Experienced in using a wide range of software tools and test equipment:
  - **HSPICE**, **HFSS, JMP,** PSpice
  - **SPEED2000, PowerSI**
  - **SPECCTRAQuest,** Allegro Viewer, **OrCAD, HyperLynx GHz**
  - **SPICE, IBIS**, and **S-Parameter** models
  - Other SI Simulation tools: **IConnect,** LINPAR, MULTLIN
  - Software productivity tools: **MATLAB**, **Excel** (for raw data manipulation), Microsoft Project & Visio
  - Test Equipment: **Sampling Oscilloscope (20 GHz), High-Speed Probes**, **TDR/TDT** (time domain reflectometer), **VNA (vector network analyzer), BERT** (bit error ratio tester), logic analyzers, **Spectrum Analyzers**
- **Consulting & Contracting work, on-site or off**
- **Prefer to use my own high-speed (20 GHz) instruments and SI software tools**

EDUCATION

M.S.E.E., SAN JOSE STATE UNIVERSITY, San Jose, California, 1978
B.S.E.E., CALIFORNIA STATE UNIVERSITY, Chico, California, 1975
A.A.E.E., ELEKTRONICKA PRUMYSLOVA, Prague, Czechoslovakia, 1968

HISTORY – SOME LARGER CONTRACTS (corp. to corp. contracts or 1099)
Dates: 1989 to Present
Company: Bekera Consulting, Inc., www.bekera.com
Company Business: Signal Integrity and Power Integrity Consulting
Position: Principal Consultant

CLIENTS:
For additional details, go to www.bekera.com/clients.html

Dates: 2007
Client: Lightfleet Corporation.
Company Business: Lightfleet Corporation has invented and developed a new way of letting computers talk to each other using broadcast light eliminating the wires. This invention, called Corowave technology, makes systems smaller, use less power, do more work, and get less congested. Lightfleet is headquartered in Camas, Washington (near Portland, Oregon).
Accomplishments: System-wide Signal Integrity simulation of company's prototype. System contained PCI Express 2, DDR2, AirMax connectors, 1000 pins BGA packages, and PCB traces up 40 inches long.
SW Tools: HSPICE, and JMP.
HW Tools: 20 GHz Agilent 86100C oscilloscope.

Dates: 2006
Client: Pentum Group, Inc.
Company Business: Pentum Group, Inc. is creating the basic networking technology to meet the demands of next generation high-performance computing (HPC) and Distributed Real-Time Embedded (RTE) systems. This networking technology will enable these systems to achieve very effective memory/processor balances that are capable of scaling to very large systems with very large communication bandwidths. Pentum Group, Inc. is a privately held California-based company.
Accomplishments: Signal Integrity and Power Integrity design, simulation and testing of large and unusually complex digital PCB for Swift40e system. Working with DDR2 SDRAM, PCI Express (PCIe), OC-768c, and Virtex-5 FPGA from Xilinx, Inc.
SW Tools: HSPICE, and JMP.
HW Tools: 20 GHz Agilent 86100C oscilloscope.

Dates: 2005 - 2006 (several one-month long contracts)
Client: Canesta, Inc.
Company Business: Canesta is involved in electronic perception technology that permits machines, consumer and electronic devices, or virtually any other class of modern products to perceive and react to objects and individuals in the nearby environment in real time, particularly through the medium of "sight," utilizing low-cost, high-performance, embedded sensors and software.
Accomplishments: Designed, simulated, and tested new light source and light source driver board. Original specification for rise time of light, 4 ns, has been improved down to 1.7 ns. This involved switching 3 A in less than 600 ps.
SW Tools: HSPICE, Linpar, and OrCAD.
HW Tools: 8 GHz Tektronix real time scope and 100 ps light sensor.

Dates: 2004 – 2005 (major contract, 11 months)
Client: Intel, Inc.
Company Business: Computing and communications products.
Accomplishments: Models development and simulations of CSI (new Intel serial link @ 6.4 GT/s) and PCI Express (at new speed of 5 GT/s). Statistical analysis and predictions of DPM (defects per million) in production. Writing HSpice decks and implementing DOE (design of experiment) protocol. Deriving models of vias, connectors, sockets, packages, and differential transmission lines. Power Integrity simulations/design. Goals: Maximizing eye opening, low jitter, low noise, low crosstalk, and controlling DPM and cost.
SW Tools: HSPICE, JMP, HFSS, SPEED2000, Excel, and Intel's own in-house signal integrity programs.

Dates: 1999 – present (ongoing short contracts)
Client: HV Design.
Company Business: PCB layout and engineering services to NASA, Lockheed Martin, and some other Silicon Valley companies.
Accomplishments: Providing signal integrity support and pre-layout and post-layout simulations of high-speed packages, digital boards, and backplanes. Recommending and supervising all critical traces, vias, clearances, layout strategy, and layout changes. Correlation of simulation results to test results. Goals: Ensure that new PCBs from HV Design will work the first time. Most boards are extremely critical components of larger systems.
SW Tools: SPECCTRAQuest, HFSS, HSPICE, PowerSI, OrCAD, and Allegro Viewer

Dates: 2003 (seven months long contract in Singapore)
Client: Aura Communications, Inc.
Company Business: Wireless communications.
Accomplishments: Performed major redesign, troubleshooting, and testing of wireless headsets. Managed large-scale manufacturing of the product in Singapore, Indonesia, and Malaysia. Supervising the design of plastic parts for product's enclosure. Responsible for keeping the project on time and on budget. Goal: On time delivery of 10,000 working wireless headsets.
SW Tools: Microsoft Project, Visio, PSpice, OrCAD, and Allegro Viewer.

Dates: 2002 – 2003 (several one-month long contracts)
Client: Zultys Technologies, Inc.
Company Business: Telecommunications and data communications for enterprise networks.
Accomplishments: Provided signal integrity analysis of differential transmission lines, pre-layout and post-layout simulations of high-speed digital boards, and backplanes. Developed layout rules and performed eye margin and jitter measurements. SPICE modeling of IC drivers created from scratch starting with data book specs. My recommended layout changes ensured error free performance. Consulted on ECL device technology, system use, and definition of parts.
SW Tools: PSpice, OrCAD, LINPAR, and MULTLIN.

Dates: 2002 (nine months long contract)
Client: Rambus, Inc.
Company Business: Leading innovator and provider of chip interface solutions.
Accomplishments: Performed signal integrity characterization, analysis, and modeling of DDR, RDRAM, and RIMM modules working in 133 to 1200 MHz range. Evaluated low-cost PCB layout options and device packages. Utilized eye diagram instrumentations and window margining. Provided assistance to customers with Verification Process.
SW Tools: HSPICE, LINPAR, Allegro, and MULTLIN.

Dates: 2001 (major six months long contract)
Client: Spirent Communication, Inc.
Company Business: Digital telephony test equipment.
Accomplishments: Consulted on development of reliable and cost-effective design of backplane (17"x21", 22 layers, 9,000 differential lines, tr: 200 ps) for new Abacus 2 system. Complete SPICE simulations of this hot-plug system. Assisted with Stackup planning, developed Layout design rules. Recommended possible future changes to increase performance. Goal: On time delivery of working prototype.
SW Tools: PSpice, HFSS, OrCAD, Allegro Viewer, and LINPAR.

Dates: 2000
Client: Voler Division of Strawberry Tree, Inc.
Company Business: Electronic and mechanical design, data acquisition, machine vision, motion control, and interfacing to sensors.
Accomplishments: Designed high-speed data acquisition board with ADC & DAC converters for earthquake researchers. This project was sponsored by University of California, Davis.

SW Tools: Berkeley SPICE, MATLAB, Allegro Viewer, and OrCAD.

Dates: 1996 – 1997 (major repeat-business contracts)
Client: Turbo Instruments, Inc.
Company Business: Electro-magnetic liquid flow measuring instruments for industrial use.
Accomplishments: Developed analog and mixed signal boards. ADC & DAC, low noise amplifiers, 4-20 mA analog loop, display, shielding, and enclosure. Goal: Successful redesign of existing German instruments for American market.
SW Tools: PSpice and OrCAD.

Dates: 1989 – 1994
Client: Boham Inc., Prague, Czech Republic, Europe (this was my own company)
Company Business: Electro-magnetic liquid flow measuring instruments for industrial use.
Accomplishments: Launched the company to address a market need in Czech Republic's instrumentation industry.

- Negotiated funding, designed initial product, managed design group, and developed an instrument to measure flow of liquids.
- Performed multiple roles as engineer, president, salesman, manufacturing specialist, customer-support person, buyer, advertising designer, and accountant.
- Sold the business for $260,000.

HISTORY – PERMANENT POSITIONS (direct employee, W2)

Spirent Communications, **Zarak Systems Division, Sunnyvale, California** 2000 - 2001
Project Manager
Managed hardware and software teams – 29 engineers in all – in the development of PCBs for premium bulk calling telecommunications equipment capable of generating traffic at 20 million calls per hour.

- Managed the definition, design, and development of four new boards, including responsibility for hardware, software, scheduling, documentation, and testing.
- Selected connectors, drivers, stackup, grounding configuration, power distribution (2 kW), and cooling.
- Evaluated signal integrity, power integrity, LVDS and BLVDS driver performance.
- Analyzed noise, jitter, reflection, and crosstalk interference using HSPICE and HFSS simulation/modeling.
- Instituted system-wide PCB layout rules and fabrication specifications.
- Supervised layout, fabrication process, and testing of the backplane and system.
- Assisted in the development of their business plan to take the company public (IPO)

Aureal Inc., Fremont, California and Hong Kong, China 1997 - 2000
Manager, Consumer System Engineering
Defined, developed, and manufactured high-end PC audio system.

- Managed team of five hardware, three software, and two audio engineers.
- Designed digital attenuators, equalizers, microcontroller board, and testing procedure.
- Modified 400 W power supply and audio-power amplifiers.
- Managed UL, CE, and FCC testing, selection and price negotiation of Chinese components.
- Supervised and helped with custom development of speaker drivers by Vifa-Speak Inc., Denmark.
- Coordinated the manufacture of products by Ocean Manufacturing Ltd., Guangzhou, China.
- Assisted in winning an acrimonious patent lawsuit in which $60 million was at stake.

Turbo Instruments, Orinda, California 1994 - 1996
Engineering Manager
Launched and managed an engineering department for Turbo Instruments' parent company, Turbo-Werk Messtechnik GmbH, Koln, Germany. The company was an international designer and manufacturer of industrial liquid flow measuring instruments, now it is part of Siemens, Inc.

- Designed two new instruments to better answer demands of US market.
- Developed precise (< 0.01%) current regulating circuit. Used PSpice modeling and verification.
- Developed high-current (up to 25 A) drivers to drive large inductive loads.
- Qualified AC/DC power supplies and DC/DC converters, protection, V-sense, and resolved thermal issues.

California Eastern Laboratories Inc., Santa Clara, California 1987 - 1989
Applications Engineer, Digital
Managed the introduction of a new GaAs (2 GT/s) logic family to the U.S. market for this major importer and distributor of NEC Corp. (Japan) products.

- Provided full technical support and supervised education and interaction between customers and manufacturer.
- Resolved product issues with customers, developed application notes, delivered technical presentations and classes about high-speed digital signals, and represented company at trade shows.
- Provided technical support for customer visits and on-the-spot resolution of design issues.
- Traveled extensively on business trips between Japan and USA
- Contributed to growing sales of GaAs logic family from zero to $1.8 million in two years.

Aydin Microwave Division, San Jose, California 1985 - 1987
Fiber Optics Project Leader, Digital Communications

- Designed an experimental fiber-optics transmitter and receiver operating at 565 Mbps.
- Developed low-noise RF amplifiers, clock recovery, laser driver, filters, and packaging.
- Designed digital boards using MECL 10K and MECL III logical families.

- Implemented transmission lines, terminations, clock and data distribution.
- Conducted system design, SPICE simulation, BER (bit error ratio) prediction, and testing.

Ampex Corporation, Redwood City, California 1984 - 1985
Senior Engineer, Data System Division

- Successfully executed a redesign of an existing professional video recorder (VPR-5, manufactured in Switzerland) into a portable and noiseless digital recording instrument.
- Designed read/write channel for magnetic tape drive recording system.
- Designed analog and digital circuits, AGC amplifiers, oscillators, PLLs, op-amps, equalizers, and analog filters.
- Simulated, analyzed, and measured head/tape interface.
- Analyzed BER and window margin measurements.
- Final product was manufactured and very successfully sold to the U.S. Department of Defense.

Harris Corporation, Farinon Lightwave Division, San Carlos, California 1980 - 1984
Senior Development Engineer

- Responsible for development of fiber optic transmitter and receiver operating at 274 Mbps.
- Designed digital circuits using ECL, MECL 10K and MECL III, logic families.
- Developed a clock recovery hybrid, which became standard circuit used in other systems.
- Developed RF section of QPSK digital radio system operating at 91 Mbps.
- Designed IF amplifiers, PLLs, VCOs, oscillators, and mixers.

Institute National de'Electroniquer, Boumerdes, Algeria, Africa 1978 – 1980
Professor of Electronics

- Taught telecommunication course and analog/digital circuits course at junior college level.
- Developed and taught course on troubleshooting analog and RF circuits.

NOTEWORTHY

- Contributing member of IEEE (Institute of Electrical and Electronics Engineers, Inc.).
- Member of PATCA (Professional and Technical Consultants Association).
- California Board of Registration for Professional Engineers, # 32915.
- College Instructor Credential # 28 9 FEY 001, No. 183506, 7/13/1978, Electrical Engineering.
- Married, one child.
- Interests include scuba diving, basketball, skiing, history of science, anthropology, psychology and theater.
- My name before 3/22/1990 was Ludvik J. Feygl. Changed name for personal reasons.
- DOD secret clearance.
- Languages: English, Czech (bilingual and bicultural), French, Russian.
- **US citizen** and citizen of Czech Republic, a member of the European Union.