AKBAR BAGHBANI

DSP ENGINEER
FPGA DESIGNER

CONTACT

Petit-Lancy, Geneva
+41-78-232-8487
abaghbani@gmail.com
linkedin.com/abaghbani
github.com/abaghbani

DATE OF BIRTH

14 Jul 1976

ABOUT ME

Experienced Senior Engineer specializing in FPGA design, digital signal processing, and high-speed electronics. Expert in wireless communication protocols, embedded systems, and gigabit serial interfaces.
Passionate about designing cutting-edge hardware solutions and optimizing complex digital systems.

LANGUAGES

English ●●●●●
Fench ●●●○○
Farsi ●●●●●

Profile

I am a highly experienced **Digital Signal Processing (DSP) and FPGA Engineer** with a strong background in **wireless communication and high-speed digital design.** My expertise spans the design, analysis, and development of advanced communication systems, specializing in **Bluetooth** and other protocols such as **Wi-Fi and WPAN.**
With extensive experience in **FPGA design and high-speed RTL coding**, I have worked on cutting-edge tecknology handling 5/10 Gbps data rates. I am proficient in high-speed board design and have a deep understanding of gigabit serial protocols, including **PCIe, USB, HDMI/DP, and SAS/SATA.** Additionally, I have significant expertise in memory interface technologies, including **DDR3/DDR4, AXI4, DFI, and Memory Controllers.**
My passion lies in developing innovative hardware solutions and pushing the boundaries of digital communication technology. I am always eager to tackle complex challenges and contribute to advancing high-speed digital systems.

Technical Skills

- **Digital Signal Processing (DSP):** Modulation and demodulation for wireless protocols, DDS, up/down sampling, filter design, SDR, FPGA-based DSP implementation.
- **HDL & FPGA Design:** VHDL/Verilog programming, cross-clock domain handling, high-speed core clock design, simulation.
- **FPGA Platforms:** Xilinx & Intel (Altera) FPGA expert, experience with high-speed digital design and transceiver tuning, timing analysis, chip planning, Gigabit transceiver IP cores, memory controller IP cores, Zynq platform.
- **Board Design:** FPGA-based system design, high-speed ADC integration, schematic design in OrCAD, PCB design in Allegro.
- **Embedded Programming:** C/C++ for embedded systems like Zynq, PowerPC, ARM (Kinetis, STM32), and NIOS-II.

PROFESSIONAL

Python, Matlab

Vhdl, Verilog

C,C++,C#

Projects

- **Bluetooth Analyzer**: Designed a specialized SDR for Bluetooth full-band (80MHz from 2400 to 2480 MHz), including filtering, DDS, and demodulation for all PHY layers. Developed packet detection and data extraction techniques.
- **DDR3/DDR4 JEDEC Analyzer**: Developed an analyzer for 400 to 1600 MHz frequency range, implementing a trigger block for protocol violations and advanced IOE synchronization on Stratix FPGAs.
- **USB 3.0 Analyzer & Exerciser**: Designed a USB 3.0 protocol analyzer supporting all speeds (SS, HS, FS, LS), including a 150MHz trigger block and sequencer for precise event capture.
- **PCIe Gen2 Test Card**: Developed a compliance test card for PCI Express 2.0 in collaboration with Intel, ensuring full compliance with industry standards and designing a PCIe switch/jammer for protocol testing.
- **Railway Monitoring System**: Designed a large-scale railway monitoring panel, developing a custom PLC to control 10,000 digital outputs.
- 30KVA Online UPS System: Designed and programmed an embedded controller for an online 30KVA UPS with automatic static switch and floating battery management.

WORK EXPERIENCE

SENIOR DSP/FPGA ENGINEER, ELLISYS SA
Geneva/Switzerland | 2014-present
Lead the study and design of Bluetooth modems, focusing on new advancements in Bluetooth and wireless technologies.

DIGITAL/FPGA ENGINEER, HEXOSYS
Kuala-lampur/Malaysia | 2007-2014
Managed and led a team of FPGA engineers in developing DDR3/4 protocol analyzers and USB 3.0 analyzer/exerciser.

DIGITAL ELECTRONIC ENGINEER, MAHARAN
Tehran/Iran | 2001-2007
Hardware design and embedded programming for railway monitoring and control systems, including a large-scale Mimic Panel and UPS systems.

EDUCATION

M.SC, ELECTRICAL AND ELECTRONICS ENGINEERING
Sharif University of Technology | 1998-2000
Thesis: *Design and implementation a robust controller for a Flexible Transmission System*, Control Lab of Sharif University.

B.SC, ELECTRICAL AND ELECTRONICS ENGINEERING
K.N.Toosi University of Technology | 1994-1998
Thesis: *Design and implementation a Compressing System for a PCM line.*