

# PALREDDY ANURAG

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## ROLE: COMPUTER ENGINEER

### EXPERTISE:

<u>HARDWARE</u>		
+ INTEL:	x86-x64 Architecture (Sandy Bridge - Core i3 -2310M)	: MICROPROCESSOR
+ MICROCHIP:	dsPIC30F, PIC32MM, PIC32MX470F512L (MIPS32 M4K), PIC32MZ2048EFM	: MICROCONTROLLER
+ XILINX:	Spartan-6 - XC6SLX150-2FGG484I	: FPGA
+ HARDWARE INTEGRATION		
* Analog Devices	AD5933 – Impedance Analyser, AD9832 – Direct Digital Synthesis, AD9629 – ADC, ADXL345 – G-Sensor	
* Texas Instruments	TPS727- LDO, bq24074 – Li-Ion Charger IC, bq27441 – Fuel Gauge, TL074 – Audio Op-Amp	
* MISC	MicroSD, LCD, Keypad	
+ TOOLS:		
* SOFTWARE:	ALTIUM Designer	
* HARDWARE:	Multi-Meter, Oscilloscope (PC Based-Instrustar), Logic Analyser (PC Based-Kingst)	
+ Hardware Design and Testing:	Professional	
+ PCB Design, Assembly(SMD):	Limited Working Knowledge, Non-Professional/Laboratory Testing Level	
<u>EMBEDDED SOFTWARE</u>		
+ O.S.:	FreeRTOS	
+ DRIVERS:	MPLAB Harmony, MLA	
+ TOOLS:	MPLAB X, MPLAB Harmony Configurator (MHC)	
+ PROTOCOLS:	UART, SPI, I <sup>2</sup> C, MIL-1553B, USB, TCP-IP-Ethernet	
+ MISC:	Micro-Controller- (Timers, Interrupts, RTCC, ...), FAT File System	
<u>DESKTOP SOFTWARE</u>		
+ O.S.:	Windows-10, Win32-API, Win32-GUI (Model View).	
+ TOOLS:		
* MAJOR:	Microsoft Office, Visual Studio, Visio, QtiPlot, MATLAB - Simulink, COMSOL	
* MINOR:	Microsoft Message Analyser, USBlyzer, IONinja Device Monitor	
<u>LANGUAGES</u>		
+ C		
<u>ENGINEERING APPROACH</u>		
+ Mathematical Modelling, Algorithms/ Infrastructure Design		
+ Flowcharts/Control Flow Diagrams		
+ Data Flow Diagrams (DFDs)/Circuit Diagrams		
+ State Transition Diagrams(STD)/Finite State Machines (FSM) – {Moore, Mealy}		
+ Sequence Diagrams/Timing Diagrams		

### EMPLOYMENT DETAILS:

<b>Employer</b>	<b>ZENTRONICS SYSTEMS (Electrical Industry)</b>	(Jun/2017-Oct/2019)
<b>Designation</b>	Computer Engineer	
<b>PROJECT</b>	Impact Recorder (2 Years 6 months)	
<b>Description:</b>	Measures Impact ~ Shocks to Electrical Transformers during Transport, helping to identify damages during Transit - Useful for Insurance Purposes.	
<b>Role:</b>	<p><u>HARDWARE</u>: Block Diagrams, Circuit Design, Board Testing. First PIC Curiosity Development Board was used for the Purpose of proof of concept, later full-fledged PCB Board was Developed.</p> <p><u>EMBEDDED SOFTWARE</u>: Application code is written to record acceleration data from G-Sensor and store it to Micro-SD Card. The Module Hibernates during inactivity period to conserve Battery-This happens due to long Journey Times and no bumps/shocks. A Charger is provided to Charge Rechargeable Li-Ion Battery via USB. Fuel Gauge is used to measure the Voltage, Current drawn and other parameters of Battery. User is provided options via switches to start and stop recording of data and a status switch. LEDS are provided for indication of recording, not recording, charging, fault conditions. User can interact with unit using PC via USB for data exchange, UART (USB to UART Chip is used here) for Debugging Messages.</p> <p>The code controls Peripheral Modules like Micro-SD Card, G-Sensor, Charging IC, Fuel Gauge IC, Timers, Interrupts, USB, UART....</p> <p>Engineering Approach of Data Flow Diagrams, State Transition Diagrams, Flowcharts, Sequence Diagrams were employed for the Purpose.</p> <p>MPLAB Harmony Framework, FreeRTOS were used to simplify, cut down the development time considerably and were used out of Box.</p> <p><u>DESKTOP SOFTWARE</u>: Native Win32 GUI application was developed using Model View Controller approach to retrieve recorded and stored G-Sensor data via USB from product to display on graphs (python script-matplotlib) and data logging for further analyzation and processing.</p>	

**Concepts:** PIC32-Controller-Peripherals - {UART, SPI, I<sup>2</sup>C, USB, Timers, Interrupts, ...}, Microchip MPLAB Harmony – State Machine Modelling, Sequence Diagrams, FreeRTOS – Inter Thread Synchronization-Communication via Task Notification, Message Queues, Win32-App Development-Model View Controller GUI, Thread Synchronization via Events, Process Communication via Pipes.

<b>Employer</b>	<b>APOLLO COMPUTING LABS (Avionics Industry)</b>	(Apr/2014-Oct/2016)
<b>Designation</b>	Computer Engineer	
<b>PROJECT</b>	Integrated Tele-Command System (10 months)	<u>Client:</u> ASL, Hyderabad
<b>Description:</b>	Receive and Demodulate FM-FSK Signal Using FPGA, the decoded signal – {SAFE, ARM, TT, DESTRUCT} command words are used to drive relays.	
<b>Role:</b>	MATLAB-System Generator Simulation. <u>SIMULINK SIMULATION:</u> Demodulating the digitized signal in FPGA and hence extracting the required Signal. First Simulation is Performed using Simulink Tool of MATLAB for Mixed Delay FM-Demodulator, FSK Demodulation Algorithm. Next Xilinx blocks in Simulink (Xilinx System Generator) are used to get accurate simulation for FPGA. Then this is converted to Verilog Code by MATLAB Tool which is dumped into FPGA. <u>Designed by RF Team:</u> Receives FM-FSK Modulated Signal in 2.2 GHz Range, Shifts the spectrum to 70 MHz Intermediate Frequency, Bandpass Samples it using ADC- Analog Devices - AD9629-40 @ 32MSPS thus digitizing as well as shifting signal spectrum to 6 MHz range.	
<b>Concepts:</b>	Nyquist Sampling Theorem, Bandpass Sampling, AD9629, Spartan-6.	
<b>PROJECT</b>	S-Band Rx Controller – Interface (3 months)	<u>Client:</u> DLRL, Hyderabad
<b>Description:</b>	User Interface to control ADF4355-PLL and other system Parameters.	
<b>Role:</b>	<u>Hardware:</u> Circuit Design, Board Testing, BOM Preparation. <u>Software:</u> To write C-Code in MPLABX for dsPIC30F5011 Microchip PIC-Microcontroller for designing of S-Band Rx Controller which sets the options of ADF4355 PLL via SPI interface according to User need set via keypad, controlling I.F., Video Switches via GPIO lines, Inputs and Results are displayed via LCD.	
<b>Concepts:</b>	dsPIC30F5011, SPI, ADF4355-PLL, Keypad, LCD, Data Flow Diagrams.	
<b>PROJECT</b>	1553B-HARNESS TESTER (12 months)	<u>Client:</u> ARDE Pune
<b>Description:</b>	Check faults in MIL-STD 1553B network - Stub Shield Short, Stub Continuity, Bus Termination, Bus Shield Short and Phase Reversal.	
<b>Role:</b>	<u>Hardware:</u> Circuit Design, Circuit Simulation in Altium for Phase Reversal Test, Board Testing. <u>Software:</u> To write C-Code in MPLABX for dsPIC30F5011 Microchip PIC-Microcontroller which tests MIL-1553B Bus for any Faults. The Code Controls Various Modules like LCD for User Display, PWM signal for Phase Reversal, Impedance Analyzer using I <sup>2</sup> C Protocol for Bus Termination Test, Internal ADC for Resistance (Stub Shield Short and Continuity Tests), Internal Timers, switches and various IO Pins Required for The Unit Functioning.	
<b>Concepts:</b>	{Resistance, Impedance} Measurement, ADC, 1553B-Bus Electronic Characteristics (Hardware Layer), Balanced Differential Lines (Shield), Bus Termination, dsPIC30F5011, ADC, PWM, LCD, AD5933, Microchip MLA.	
<b>PROJECT</b>	Pinaka Missiles Test JIG- SASU ELM - Fuse Setter (5 months)	<u>Client:</u> ARDE Pune
<b>Description:</b>	To present electronic signals for Pinaka Missile similar to real time. Input to system via Keypad and Switches, reaction of the rocket is monitored via UART, Output Signal Lines- {SQ, DET, SPIN, TBIG, TBSTAT} are monitored via scope. Status of reaction is displayed on LCD.	
<b>Role:</b>	<u>Hardware:</u> Board Testing <u>Software:</u> To write C-Code in MPLABX for dsPIC30F5011 Microchip PIC-Microcontroller which controls given modules and Application Logic (includes SASU Communication Protocol) required to test the Pinaka Missile Response.	
<b>Concepts:</b>	dsPIC30F5011, UART, Timers, Interrupts, GPIO, Keypad, LCD, Microchip MLA, Control Flow Diagrams.	
<b>Extra:</b>	Class- {AB, D} Amplifiers, Analog Filters- {Butterworth, Likwitz-Riley}, Zobrist Hashing, Alpha-Beta Search	
<b>EDUCATION:</b>		
<b>University</b>	<b>BIRLA INSTITUTE OF TECHNOLOGY &amp; SCIENCE</b> , Pilani, Rajasthan, India	(2011-2013)
	M.E. Embedded Systems with CGPA: 7.78/10.0	
	<u>Subjects:</u> Embedded Systems, Real Time Systems, Software for Embedded Systems, Reading Course	
<b>Engineering College</b>	<b>CVSR College of Engineering</b> , Hyderabad, India	(2007-2011)
	B.E. Electronics and Communication Engineering; (JNTU) with 63.53%	
	<u>Subjects:</u> C, Electronic Devices and Circuits, Computer Organization, {Linear, Digital} IC Applications.	
<b>College</b>	<b>VIJAY RATNA JUNIOR COLLEGE</b> , Hyderabad, India	(2005-2007)
	Board of Intermediate Education (BIE), A.P, with 88.0 %	
<b>School</b>	<b>THE HYDERABAD PUBLIC SCHOOL, RAMANTHAPUR</b> , Hyderabad, India	(1997-2005)
	Central Board of Secondary Education (CBSE) with 88.0 %	
<b>Additional Information</b>	<u>Address:</u> 3-16-49 Nehru Nagar, Ramanthapur, Hyderabad, Telangana, India Fluent in English and Telugu, enjoy reading novels and playing Table Tennis.	