



SHRI VISHNU ENGINEERING COLLEGE FOR WOMEN
(Autonomous)

Department of Electronics & Communication Engineering

Vishnupur, Bhimavaram – 534202

TI-Digital Signal Processing Laboratory

Laboratory-in-Charge : Mr. E. R. Praveen Kumar

Laboratory-Technician : Mr. Ch. Chandra Sekhar

Objective:

The DSP Laboratory aims to provide a comprehensive environment for advanced study and experimentation in digital signal processing and related fields. It is designed to equip students and researchers with hands-on experience using state-of-the-art DSP trainer kits, including the TMS320C6713, TMS320C6416, and TMS320C6455, along with various application-specific modules for image and video processing. The lab is also supported by MATLAB software, offering extensive toolboxes for signal processing, control systems, and embedded systems development. Additionally, the laboratory is furnished with essential measuring instruments, high-performance computers, and peripherals to facilitate a wide range of experiments and real-time analysis. By integrating these resources, the laboratory seeks to enhance understanding and innovation in DSP technologies and applications.

By the end of this course, students should be able to:

1. **Develop Proficiency in DSP Techniques:** Equip students and researchers with practical skills in digital signal processing through hands-on use of DSP trainer kits and software tools, enabling them to design, analyze, and implement DSP algorithms effectively.
2. **Facilitate Advanced Experimentation:** Provide a comprehensive platform for conducting advanced experiments in signal processing, medical imaging, and multimedia applications using high-performance DSP kits, interfacing cards, and MATLAB software.
3. **Enhance Problem-Solving Abilities:** Foster problem-solving and critical thinking by engaging with real-world DSP challenges, including image and video processing, and applying theoretical knowledge to practical scenarios using laboratory equipment and instruments.
4. **Support Multidisciplinary Research:** Encourage interdisciplinary research and development by integrating DSP technology with applications in fields such as communications, control systems, and embedded systems, leveraging the laboratory's diverse resources and tools.

Lab Equipment:

S.No.	Item Description	Qty
1	DSP Trainer Kits (TMS 320C6713 DSK 16 MEG SDRAM) WITH CCS	5
2	DSP Trainer Kits,VSK-6713, Multi Media Speakers	5
3	DSP Trainer Kits,VSK-5416	5
4	DSP Trainer kits, VSK-6713	4
5	DSP Starter Kit (DSK) TMS320C6416 WITH Code Composer Studio-1	
6	DSP Starter kit (DSK) TMS 320c6416+Image/ Video Interfacing Card +Image Video Daughter Card with on Board Display With Code Composer Studio-1	
	Application Development Kit TMS320C6455 Starter Kit (DSK) For Medical Imaging-2	
	Heterogeneous Platform For Image & Video Application xtremes DSP KIT-1	
	Bloom With DSP Tutor Bloom With DSP Two MATLAB/SIMULINK /II-DSP V2.0 9 - 2(USERS)	
7	Digital Funds Camera (BOACH)	1
8	TI- Analog Kit(ALSK)	6
9	Gain Measuring Instruments (1. Digital Storage Oscilloscope,2. Dc Power Supply 30v, 5Amps, 3. Digital Multimeter 5& 1/2 Digit, 4. Electronic Instrumentation Trainer Kit)	1
10	MATLAB Software campuswide licence unlimited Users (Neural network, control systems, Fuzzy logic, Signal Processing, Communication, Filter design, Wavelet, RF Tool,Link for code composer studio, Image processing, Simlink , Simpower systems,Embedded Target, Real time Workshop, Signal Processing block set tool boxes for 1 users))	1
11	Computers: (Intel Pentium Duo Core E2140 Processor 160GHZ, 15" TFT Monitor)	33
12	Computers: (Intel Pentium Duo Core E2140 Processor 160GHZ, 15" TFT Monitor)	3
13	Computers: (HP PRO 3090 MT Desktop, Intel Pentium Dual Core F5500,2.86GHZ Processor, 18.5 wide Monitor)	10
14	Computer Monitors: HP PRO 3330 18.5 Inches Desk Top	6
15	Analog Discovery Kits	19
16	Digital Multimeter	1
17	HP SJ 4850 Scanner (230 - 12v Convertor adaptor, USB card, Software CD)	1
18	HP Laser Jet 1020 Printer	1
19	HP Laser Jet 1022 Printer	1
20	CRO 30 MHz	3
21	3 M Hz Function Generator	5
22	11 KVA UPS With 20 Batteries	1
23	LCD Projector (SANYO PLCXD220)	1

24	P A System	1
25	HUB Rack 4U	1
26	24 PORT Ethernet Switch	3
27	Jack Panel	3

Outcomes of TI-DSP:

Speech Processing LAB estd 2018.

The effective utilization of the TI-DSP Laboratory played a crucial role in securing a research grant of ₹51,58,834 from the Department of Science and Technology (DST) in the year 2018. This grant was awarded to Dr. N. Prasad, serving as the Principal Investigator, and Dr. G.R.L.V.N. Srinivasa Raju, as the Co-Principal Investigator. The grant supported a significant research initiative, which was successfully completed. The major equipment procured through this grant greatly enhanced the laboratory's capabilities, including

S.No.	Item Description	Qty
1	DSP Trainer Kits	20
2	NTT Database	
3	TIMIT Database	
4	specialized Speech Recording Equipment	1
5	Amplifier	1
6	5.1 Surround Speaker System	1
7	Noise-Free Studio Environment	
8	High-end computer systems	3
9	Raspberry pi 3 Boards	3
10	Raspberry pi 4 Boards	1
11	Headphones	3
12	MATLAB Software 3 Users	

The successful implementation of this project underscores the laboratory's pivotal role in advancing research and development in digital signal processing.

Outcomes

- et.al, N. P. (2021). Adaptive Data Hiding Based Telephony Speech Enhancement. Turkish Journal of Computer and Mathematics Education (TURCOMAT), 12(3), 3913–3923. Retrieved from <https://turcomat.org/index.php/turkbilmater/article/view/1680>.
- N. Prasad., E. Praveen Kumar., P. Sitaramanjaneyulu. and G. R. L. V. N. Srinivasa Raju., "Telephony Speech Enhancement for Hearing-Impaired People," 2020 5th International Conference on Computing, Communication and Security (ICCCS), Patna, India, 2020,
- R. P. K. Emani, P. Telagathoti and P. N, "Telephony Speech Enhancement for Elderly People," 2020 4th International Conference on Computer, Communication and Signal

Processing (ICCCSP), Chennai, India, 2020, pp. 1-4, doi: 10.1109/ICCCSP49186.2020.9315269.

- *R. P. Kumar Emani, P. Telagathoti and N. Prasad, "Performance Assessment of Simulink Based Speech Radio Band Extension Technique on Elderly People," 2022 International Conference on Inventive Computation Technologies (ICICT), Nepal, 2022, pp. 800-804, doi: 10.1109/ICICT54344.2022.9850946.*
- *R. P. K. Emani, P. Telagathoti and N. Prasad, "Performance Evaluation of Speech Radio band Extension Technique using Simulink," 2022 2nd International Conference on Artificial Intelligence and Signal Processing (AISP), Vijayawada, India, 2022, pp. 1-5, doi: 10.1109/AISP53593.2022.9760573.*

No of Completed PhDs utilizing the lab :02 1. *Dr. M.Prema Kumar.*
2. *Dr. M. V. Ganeswara Rao*

No of Perusing PhDs utilizing the lab :01 Mr. E. R. Praveen Kumar