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**VIDYAVARDHINI'S NATIONAL CONFERENCE ON TECHNICAL ADVANCEMENTS FOR SOCIAL UPLIFTMENT VNC - 2020 TASU**

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Vidyavardhini's College of
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**Bank Name:** Union Bank of India
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VNC - 2020 TASU

# VIDYAVARDHINI'S NATIONAL CONFERENCE ON TECHNICAL ADVANCEMENTS FOR SOCIAL UPLIFTMENT

**VNC - 2020 TASU**

4TH APRIL, 2020

**Organized by:**
**Vidyavardhini's College of Engineering & Technology**
K.T. Marg, Vasai (W) - 401202
Affiliated to University of Mumbai
Approved by AICTE
Accredited by NAAC

**In Association With:**
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**Conference Website:** www.vcet.edu.in/vnc2020/

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## About us:

Vidyavardhini means a Body committed to enhancement of Knowledge. Vidyavardhini was established as a registered society in 1970 by late Padmashri H. G. alias Bhausaheb Vartak for the noble cause of education in rural areas.

Vidyavardhini's College of Engineering and Technology, Vasai is located on the sprawling campus of Vidyavardhini, spread over an area of 12.27 acres. It is a short, two minutes walk from Vasai Road (W) Railway Station. The college is also accessible by road from Mumbai.

Vidyavardhini Society received approval from AICTE to start the new college of Engineering & Technology with effect from July, 1994. The college is affiliated to the University of Mumbai for the four year degree program leading to the degree of Bachelor of Engineering in six branches.

## Objective of VNC 2020 TASU

Technology has always been potential tool for simplifying the way we do things. Present time demands directing the technological advancements towards addressing societal challenges such as improving health care, education environment, sanitation, agriculture, smart city, etc., VNC 2020 TASU aims to provide an opportunity to researchers, academicians, Industrialist and students to interact and share their ideologies and contributions made for social upliftment with the aid of technological advancements.

## Call for paper

We welcome submission in following area

1. Sustainable Computing
2. High Performance Computing
3. High Speed Networking and Information Security
4. Software Engineering and Emerging Technologies
5. Mathematical, Experimental, Computional and AI, IoT Techniques in Mechanical Engg.
6. Industrial Engg., ERP, MRP, SCM
7. Renewable Energy Technologies
8. Pollution control and Waste Management
9. Advances in Structural engineering
10. Present geotechnical practices
11. Present practices in construction management
12. Recent developments in Instrumentation, control and automation
13. Embedded Systems, IoT and VLSI Design
14. Optical and Wireless Communication for NGN
15. Antenna and Microwave Devices

Any other relevant topics

## Publication Information

Proceedings of VNC - 2020 TASU will be published with ISBN number

1. Selected Papers will be published in International Journal of Information Technology, Published by Springer Nature, ISSN: 2511-2104 (Print Version), ISSN: 2511-2112 (Electronic Version)
2. All papers will be published in IJERT, ISSN: 2278-0181

## Important Dates:

**Submission of full length paper**
15TH Feb 2020
**Paper Acceptance Notification**
22ND Feb 2020
**Submission of Final Version of Paper**
29TH Feb 2020
**Registration Deadline**
5TH March 2020
**PPT Submission**
20TH March 2020
**Conference**
4TH April 2020

## Registration Fee Details:

| Category of Delegates / Authors | Indian Authors & Delegates (in INR) |
|---|---|
| Full Time Students (UG) | 1,500.00 |
| Teachers/ Research Scholars/ PG students | 2,500.00 |
| Industry | 3,500.00 |

## Paper Submission:

Paper submission should be made strictly via Easy Chair the submission link for VNC 2020 "TASU":
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## Contact Us:

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# Design and Manufacturing of A Lower Limb Exoskeleton

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***Abstract*—Exoskeletons have several applications in various fields like industry, space and healthcare. Most of the research focus has been on load augmentation for soldiers, and workers in industries. There is a need to make better use of these technologies in designing a mechanism that makes people stand on their feet again, who imagined their life on wheelchairs and beds forever. They can be used in a variety of medical applications including assisting healthy senior citizens, enabling specialized training for sportspersons. We aim to produce a low cost lower limb exoskeleton that makes a paraplegic patient walk on their own. The design consists of a cage where the lower limb portion is operated by a linear actuator. Power supply is given by the battery and switch is used to control the forward and backward motion. Currently, there are various designs of lower limb exoskeletons used for gait rehabilitation. However, there is a lack of detailed information regarding the mechanical elements of these devices. This makes it troublesome for developers to design a device for a specific application. Research in this area is clearly shifting towards the ideas to overcome the main drawbacks of rigid exoskeletons, in terms of adaptability, comfort, safety, cost and efficiency. Thus, we aim to produce a device that delivers high quality treatment at lower cost and effort. These systems can also be used at home to allow patients to perform therapies independently, supporting the therapy program.**

**Keywords—exoskeleton, rehabilitation, exercise, elderly**

## I. Introduction

Exoskeletons can be defined as a skeleton that provides support to the body externally. Exoskeleton is made up of two words exo and skeleton thus it can be said that it is a skeleton to be attached externally. Exoskeletons are wearable devices that work similar to the body part attached. The healthcare sector has many passive and rigid lower limb exoskeletons. These designs are lacking in comfort, safety and efficiency. To avoid this, robotic technology has been incorporated in the exoskeletons to make it user-friendly. Robotic exoskeletons also have great importance in the fields like industry and space. At present, there are various designs available in the foreign market. The previous researchers of the topic provide insufficient data of design considerations. So, it is difficult for users to select the proper model for a specific application. For this purpose, we made some efforts to collect and study the data of existing lower limb exoskeletons.

With a population of over 1 billion, the prevalence of disability is between 1.85% and 2.19%. The fig. Below shows that there are only five manufacturing clusters in India spread across six states. The contribution of medical equipment and instruments is 54%. Most of the medical equipment and instruments used in India are imported from foreign countries. Hence there is an urgent need to start manufacturing on our own.These various types of exoskeleton are used in various fields like military, industries, medical. Kenta Suzuki et al. developed intention-Based Walking Support for Paraplegia Patients with Robot Suit HAL (Hybrid Assistive Limb). T. Hayashi et al. have developed a robot suit HAL (hybrid assistive limb) as an assistive device for lower limbs. Hiroaki Kawamoto and Yoshiyuki Sankai have developed the power assistive suit, HAL (Hybrid Assistive Leg) which provide the self-walking aid for gait disorder persons or aged persons .Current product is a active one with one or more electrical components (actuators, motor).passive exoskeleton uses mechanical components to perform necessary motion or day to day chores. Generally product obtain in the market is quite expensive our goal is to reduce the costing, thus making it affordable to common subjects

The main objective behind this project work is:

I. To facilitate movement of knee joint by providing
   - Torque
   - Power

II. To provide independency while exercising

## II.SYSTEM DESIGN

COMPONENTS

- Cage
- Actuator
- Battery
- Switch

DESIGN REQUIREMENTS

- Torque at knee
- Leg dimensions

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