

**Vikram S. Vyawahare (PhD Pursuing)**

**Designation: Assistant Professor and Head Mechatronics Engineering**

**Email:** vikramvyawahare@ternaengg.ac.in

**Address for Correspondence:**

C/o Terna Engineering College , Plot No. 12, Sector-22,  
Opp. Nerul Railway Station, Phase-II, Nerul (W), Navi Mumbai, Mumbai,



**Professional Qualification:**

- **Ph.D in Mechanical Engineering (pursuing),**  
Sardar Patel College of Engineering, Andheri
- **Master of Engineering, Mechanical Engineering 2014**  
Iowa State University, Ames IA, US
- **Master of Engineering Mechatronics 2005**  
Asian Institute of Technology, Thailand
- **Bachelor of Engineering, Mechanical 2003**  
RMIT&R, Amravati University, Badnera, Maharashtra

**Short Biodata:**

Prof. Vikram Vyawahare is heading the Department Mechatronics Engineering since 2015. He brings with him the previous experience in electronic and toy manufacturing industry along with R&D and teaching experience in Thailand and USA. He spearheaded the recent R19 curriculum revision of Mumbai University Mechatronics Engineering Syllabus and introduced several new subjects and contributed to the syllabus setting of several subjects. All Labs of Mechatronics Engineering were developed under his leadership.

**Patents/ Products/ Consultancy:**

**Products Developed:**

1. A new spatial interaction device configuration for virtual assembly which has a magnetically tracked device at one hand and a kinesthetic haptic device at the other.
2. Two 3D Bimanual Interaction Techniques for Haptic Enabled Virtual Assembly
3. Contributed to “Fuzzy Logic Based Automatic Intravenous Anesthesia Delivery and Monitoring System” development
4. Rotary table for spin riveting assembly , Mattel Bangkok Thailand.

**Patents:**

1. Australian Innovation Patent number: 2021100883 Fuzzy Logic Based Automatic Intravenous Anesthesia Delivery and Monitoring System

**Consultancy Projects:**

1. Robot Vision based Dimple insertion machine software improvement, Reflex Automation
2. SF6 Gas Evacuation and Filling Plant , Syselec Technologies Pvt Ltd

**Reviewer:**

1. ASME IDETC Conference USA 2009,2010, 2011

**Major Subjects:**

- Design of Mechatronic Systems
- Sensors and Actuators
- Instrumentation and Control
- Industrial Automation and Industry 4.0
- Applied Hydraulics and Pneumatics

**Citation Analysis:**

13 citations (h-index 2 and i10-index 0) in google scholar

<https://scholar.google.com/citations?user=jq9pUn4AAAAJ&hl=en>

**Conferences and Workshops Publications:**

Vyawahare V. S., Buktar R. B. “Survey of Augmented Reality in Mechatronic Product Design and Manufacturing” Proceedings of 5th International Conference On Engineering Research & Innovations , March 19-20,2020 Navi Mumbai India

Vyawahare V. S. , Stone R.T. “Evaluation of Bimanual Stretched String Control of Haptic Workspace Mapping for Virtual Assembly” Proceedings of the ASME 2013 International Mechanical Engineering Congress& Exposition IMECE2013 November 13-21, 2013, San Diego, California, USA,

Vyawahare V. S. , Stone R.T. “Evaluation of Bimanual Stretched String Single Object Manipulation for Virtual Assembly with Haptics” Proceedings of the ASME 2013 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference IDETC/CIE 2013 August 4-7, 2013, Portland, Oregon, USA.

Vyawahare V. S., Stone R. T. “Asymmetric Interface and Interactions for Bimanual Virtual Assembly with Haptics” Proceedings of the ASME 2012 International Design Engineering Technical Conferences & Computers and Information in Engineering Conference IDETC/CIE 2012, August 12-15, 2012, Chicago, IL, USA

Vyawahare, V.S., Vance, J.M., “Human Centered Multimodal 3D User Interface for Desktop VR Assembly,” Proceedings of the Emerging Technologies Conference (ETC) 2009, April 2-3, 2009, Ames, IA, USA

Vyawahare V.S.; Afzulpurkar N.V. “Uncalibrated Eye in Hand Visual Servoing for Fixtureless Assembly Automation” IEEE International Conference on Industrial Technology, ICIT 2006, 15-17 Dec. 2006, Mumbai, India.

Afzulpurkar, N.V.; Saeed, I.A.K.; Vyawahare, V.S. “Ceramic Tile Process Modeling for Quality Improvement Using ANN” IEEE International Conference on Industrial Technology, ICIT 2006, 15-17 Dec. 2006, Mumbai, India.

## **Research and Scholarly Contributions:**

### **➤ Ph.D. Research:**

#### **Research as PhD Scholar SPCE Andheri**

Exploratory Survey for finding opportunities of application of Augmented reality in Mechatronic System Design

#### **Research as PhD Candidate ISU USA**

- A new technique of bimanual object manipulation ‘Bimanual Stretched String Single Object Manipulation’ (BS-SSOM) which decouples positioning and orientation by providing a new virtual coupling between the two hand avatars and the manipulated virtual object.
- A new bimanual navigation technique ‘Bimanual Stretched String Control of Haptic Workspace Mapping’ (BS-SCHWM) that overcomes the limitation of (typically) small workspace of kinesthetic haptic devices.
- Facility of object transport to different parts of virtual reality scene.
- A new bimanual cursor which visually reinforces the Guiards functional kinematic chain hypothesis and provides visual indication of conceptual binding of the two hand avatars.
- A new technique of progressive grouped assembly without merging the voxmaps of the virtual objects allowing assembly and disassembly of each object individually.
- New metrics for accurate analysis of interaction characteristics namely ‘efficiency of task completion’ and ‘efficiency of manipulation’.
- User study based evaluation

### **➤ M. E. Research:**

#### **Research at AIT Thailand**

Visual servoing based pick and place using a 6 axis industrial robotic arm

## **Funding Received:**

John Deere Sponsorship (Tuition and Assistantship) for Virtual Assembly related research project at Iowa State University USA.

Received a fellowship worth US \$8400 for pursuing masters (AIT).

## **Software Tools:**

Design Software's: PTC Creo Parametric 3.0, SolidWorks, Autocad ,  
Application Programming: C, C++, Java,(professional training certified by ‘karRox Technologies’),  
VC++, Matlab, Microcontroller assembly programming and interfacing  
PLC programming (B&R, Siemens and WAGO PLC).  
SCADA and HMI development ( WinCC and CoDeSys).  
CNC/Robot Programming CNC: MAHO 5 Axis, EMCO, Robot: Kuka 6 Axis  
3D Graphics libraries: OpenGL, OpenSceneGraph  
GUI toolkits: Swing, MFC, QT  
System Simulation: LabVIEW, Matlab , ADAMS, Automation Studio  
Statistics: JMP 8  
Web Development: JavaScript, JQuery, Bootstrap, CSS, HTML, Struts 2, Struts2- Spring Integration,  
Hibernate, MySQL, Tomcat, JBoss

**Experience:**

- Assistant Professor (& HOD) Mechatronics Engineering June 2015 - date  
Department of Mechatronics Engg, Terna Engineering College , Nerul, NaviMumbai
- Lecturer July 2014- May2015  
Dept of Mechanical Engineering , Datta Meghe College of Engineering, Airoli, Navi Mumbai
- Graduate Research and Teaching Assistant, (total 3 years)  
Iowa State University Ames, IA,US.
- Project Engineer, Mar 2007 – Apr 2008  
Advanced Manufacturing Engineering ,Mattel Bangkok Ltd. THAILAND.
- Research Associate Mar 2006 – Feb2007  
Industrial Systems Engineering ,Asian Institute of Technology, Bangkok, THAILAND.
- NPI Engineer Jun 2005 - Feb2006  
Cal-comp Electronics (Thailand) Public Company Ltd.

**Responsibilities Handled:**

- Head of Department Mechatronics Engineering July 2015 till date
- Developed syllabus scheme and contributed to syllabus of several subjects of Mechatronics Engineering of Mumbai University including Design of Mechatronic Systems, Sensors and Actuators, Industrial Automation and Industry 4.0 etc.
- Paper Setting Inter-Cluster coordinator for SH2020, FH2021, SH2021 and FH2022 Online exams
- Paper setting of Mechatronics Engineering final exam papers for Mumbai University Exams.
- Convener FDP on Industrial Automation 09/12/2019 to 20/12/2019
- Invited External Academic Expert for thr course “Post Graduate Diploma in Mechatronics” K. J. Somiya College of Engineering.
- Establishment of collaboration of Mechatronics Engineering department and MOU with several companies such as SMC, B&R Automation etc.
- Organized several Guest Lectures for students from industry and academic experts

**Talks/Guest Lectures Delivered:**

1. Delivered Invited Guest lecture on “ Industry 4.0” 20<sup>th</sup> April 2021 Online mode for TE Mechanical Engineering Students of K. J. Sommiya College of Engineering.
2. Conducted FDP session on “Robot Intelligence” on 11/09/2020 ATAL Sponsored national level Faculty Development Program “Sensor Measurements and Instrumentation for Robotics”.
3. Conducted FDP session on “Robot Vision and Applications” on 11/09/2020 ATAL Sponsored national level Faculty Development Program “Sensor Measurements and Instrumentation for Robotics”.
4. Delivered an invited guest lecture on “Mechatronics Opportunities and Challenges” on 23/12/2019 in One Week AICTE-ISTE approved training Program (STTP) on “Emerging Trends in the Field of Mechatronics” 23<sup>rd</sup> -27<sup>th</sup> December, 2019 at K. J. Sommiya College of Engineering.

**SESSION CHAIR/JUDGE:**

1. Invited Jury for Sector level Rise i4 (Ingenious, Ideas, Incubation and Implementation) contest of Mahindra Auto and Farm Sector 02/12/2021
2. Served as Jury at Maharashtra level round of Mechatronics Skill Contest 3-5 Sept 2021
3. Avalon 2019 Judge for project contest and Session chair

**Faculty Development Programs Attended**

- Participated in 2 week AICTE sponsored FDP on “3D Printing for Industrial and Biomedical Applications” June 2019
- AICTE Approved FDP201x “Pedagogy for Online and Blended Teaching-Learning Process ” by IIT Bombay(2018)
- AICTE Approved FDP101x “Foundation Program for ICT for Education” by IIT Bombay(2018)
- Participated in 2 Week B&R Automation Training on Programming basic + Motion +HMI (2018)
- Attended STTP on Mechatronics Concept to Commissioning organized by SPCE, Andheri (2016).
- Faculty Development Program (FEAT 2015) organized by 3DPLM ,Pune.

**Declaration**

I hereby declare that the foregoing information are correct and complete to the best of my knowledge.

Faculty Name: Vikram S. Vyawahare

Place: Navi Mumbai