



PERSISTENT



PERSISTENT CENTER OF EXCELLENCE

MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding ("MOU") is executed as of date: **01-07-2015** ("Effective Date") between

Party 1 : Persistent Systems Limited, a limited company registered in India, having its Registered Office at "Bhageerath", 402, Senapati Bapat Road, Pune 411 016, INDIA. ("Persistent") and

Party 2 : Army Institute of Technology (AIT) with its principal office located at Pune ("Partner").

Whereas, Persistent is in the business of licensing software and providing software development services ("Persistent's solution").

Whereas, Partner is in the business of **Academic Institute** ("Partner solution").

Whereas, both the Parties wish to work together to promote mutual business interest and this MOU sets forth the terms of their understanding.

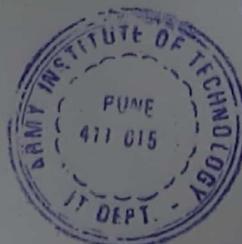
- 1. Objective:** The purpose of this MOU is to develop and expand a framework of cooperation and joint operations which will be henceforth called '**The Center of Excellence**' between Persistent and Partner to commence and progress towards a mutually beneficial engagement. This MOU seeks to crystallize the understanding of both parties as regards the mode of their engagement and define their roles, and responsibilities.

Both parties have mutually agreed to conduct the following activities under COE

- a. BE Projects
- b. Guest lectures
- c. Faculty Development program
- d. Industry visit

2. Responsibilities of College

- a. Nominate a Single point of contact (SPOC) to support this activity from college side.
- b. Provide a minimum of 20 students for the COE activity
- c. Ensure necessary logistic, infrastructural and academic support (through teaching faculty) to conduct the COE activities.
- d. Give Persistent first right of offering students



Persistent Confidential

Page 1 of 7

3. **Responsibilities of Persistent:**

- a. Nominate a Single point of contact (SPOC) to support this activity from Persistent side
- b. Provide necessary technical, logistic and infrastructural support to conduct the COE activities.

4. **Joint Responsibilities of the parties:**

- a. Ensure active participation and end to end support to achieve desired results
 - b. Set up joint progress tracking mechanism
 - c. Sync up on periodic basis
 - d. Provide infrastructure support on need basis
 - e. Follow ups with Internal as well as external stakeholders
5. Each party would bear its own expenses and cost incurred in connection with all the activities relating to the MOU. Any exception to this clause would be based on prior written consent of both the parties.
6. **Notice:** For the purpose of this MOU the contact point for either parties would be as follows:

If to Persistent:

Legal Department
402, "Bhageerath",
Senapati Bapat Road,
Pune - 411016, India
Phone : +91-20- 3024 2000
Fax : +91-20- 2565 7888
E-mail : legal@persistent.co.in

If to Partner:

Col. K.E. Vijayan (Army Institute of Technology)
Joint Director

7. **Confidentiality:** In terms of this MOU, either party will acquire or develop confidential and proprietary information concerning the other's customer and its dealings and methods of dealings with its existing and prospective customers and will develop relationships of special trust and confidence with existing and prospective customers and employees of the other (collectively "Confidential Matter"). Parties agree that such Confidential Matter is for the other party's exclusive benefit and that, either party will not directly or indirectly use or disclose any Confidential Matter, except for specified purpose. Receiving party shall use the Confidential Matter of the other party only to its employees, directors and advisors on a "need to know" basis. Disclosing party does not give any warranty for accuracy or completeness of Confidential Matter. Upon the termination of this MOU, receiving party will promptly return all the Confidential Matter to the disclosing party. The confidentiality obligations stated herein shall survive for two (2) years after termination of this MOU. The obligations contained in this Clause shall not apply to information in public domain or to information received from a third party without restrictions or to information developed independently or is in possession of the receiving party.

8. **Intellectual Property Rights:** Each party shall retain all right, title and interest in and to its Pre-Existing IP. Pre-Existing IP shall mean all intellectual property rights in any pre-existing information, data, software, tools and other materials independently developed by a party. Partner shall irrevocably assign and agree to assign to the Persistent or its designee, without further consideration, students entire right, title, and interest in and to all Inventions and Works (attached herein as Annexure 1), including all rights to obtain, register, perfect, and enforce patents, copyrights and other intellectual property protection for Inventions and Works. Partner will disclose promptly and in writing to Persistent all Inventions and Works which students have made, authored or reduced to practice. Partner will ensure that its students will assist Persistent (at its expense) to obtain and enforce patents, copyrights and other forms of intellectual property protection on Inventions and Works.

Persistent Confidential



Page 2 of 7

Partner acknowledge and agree that the assignment set forth herein is worldwide and perpetual, and that Partner will have no rights to reversion of the Inventions and Works, even if the Persistent does not exploit them. Provided that the authorship of a paper (for publishing) can be shared by those making intellectual contribution to the completion of the work along with Persistent.

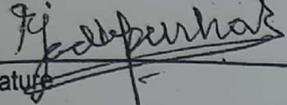
9. **Independent Contractor:** Relationship between the parties to this MOU is that of an independent contractor, and nothing in this MOU will be construed to create a joint partnership, agency, or employer-employee relationship. Parties have the sole obligation to (i) comply with applicable laws and (ii) supervise, manage, contract, direct, procure, perform or cause to be performed its obligations set forth in this MOU, except as otherwise agreed upon by the parties. Neither party has an authority to make any commitment or representation for and on behalf of the other party under this MOU.
10. **Indemnity:** Partner shall indemnify, defend and hold harmless Persistent, its Affiliates, associates and their respective officers, agents, employees, successors, assigns, and authorized representatives against any and all suits, charges, actions, legal or administrative proceedings, allegations, claims, demands, damages, liabilities, losses, costs, fees and expenses (including, without limitation, reasonable attorney's fees and expenses and the expenses of other professionals) (collectively the "Claims") as incurred by Persistent, directly or indirectly arising out of or in connection with Partner's breach of applicable laws, rules, regulations, guideline, policies etc. and any other terms and conditions of this MOU.
11. **Subcontract/Assignment:** Neither party shall assign, subcontract or otherwise transfer its rights or obligations under this MOU without prior written consent of the other party, which will not be unreasonably withheld.
12. **Non-solicitation:** During the term of this MOU, and for a period of one year thereafter, neither party shall, directly or indirectly, solicit, or attempt to solicit, engage or employ, induce or attempt to induce any person who is an employee or consultant of the other party to leave the employ of the other party.
13. **Limitation Of Liability:** NEITHER PARTY SHALL BE LIABLE TO THE OTHER FOR ANY INDIRECT, SPECIAL, CONSEQUENTIAL OR INCIDENTAL DAMAGES HOWEVER CAUSED, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. EXCEPT FOR BREACH OF CONFIDENTIALITY AND NON-SOLICIT OBLIGATIONS, THE TOTAL LIABILITY OF EITHER PARTY ARISING UNDER THIS MOU SHALL NOT EXCEED RUPEES ONE THOUSAND EQUIVALENT.
14. **Governing Laws and Arbitration:** This MOU shall be construed and governed by the laws of India. Any controversy or claim arising out of or related to this MOU, or breach thereof, shall be settled by arbitration, to be held in Pune, India in accordance with the rules of the Arbitration and Conciliation Act, 1996 and the decision of the arbitrator shall be binding on the parties.
15. **Term and Termination:** The term of this MOU shall be valid for a period of one (1) year effective from the Effective Date. Either party may terminate this MOU in the following events:
- In the event of insolvency, bankruptcy or winding up of the party
 - With a written notice of 30 days to the other party
 - On entering into a Definitive MOU



16. Miscellaneous: Parties agree that the relationship contemplated herein shall be non-exclusive. This MOU may not be extended, amended, or superseded except in writing between the parties. This MOU constitute single MOU.

IN WITNESS THEREOF, the parties hereto have caused this MOU to be duly executed by their authorized representatives as of the Effective Date written above.

PERSISTENT SYSTEMS LTD.



Signature

Mr. Rajendra Jodhpurkar

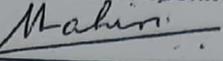
Center head Delivery Head, LSHC BU

Date

Phone : +91-20-3024 3000

Fax : +91-20-2565 7888

Army Institute of Technology(AIT),Pune (PARTNER)



Signature

Brig (Dr) SK Lahiri (Retd)

Director, AIT, Pune

07-10-2015

Phone: (020)27157534,27157612

Fax:









MEMORANDUM OF UNDERSTANDING

Between
MITu Skillologies, Nashik



And
ARMY INSTITUTE OF TECHNOLOGY, PUNE



This Memorandum of Understanding is entered on Date 02/02/2017 between: MITu Skillologies, headquartered at 12, Guruprasad, Sneh Nagar, Dindori Road, Mhasrul, Nashik, Maharashtra 422004 and Army Welfare Education Society (AWES)'s, Army Institute of Technology, Pune (AIT), Dighi Hills, Pune-411015, Maharashtra, for the purpose of enhancing the quality of engineering education being imparted to the students.

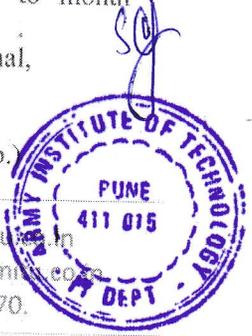
OBJECTIVES:

- A. MOU is for the purpose of enriching the technical education in new subject areas, learning-teaching process and to jointly work for enhancing the quality of education being imparted to Information Technology and other branch students.
- B. MOU is to enhance the quality of the technical education for students to enable them to meet the industry needs and to be recognized globally.
- C. MOU is to :-
 - Sponsor a BE Project.
 - Sponsor a Mini Project to student of SE/TE.
 - Conduct special lectures/workshop for students at campus/Industry with minimum cost.
 - Allow Students / Faculty for training, Industrial Visit and One week to month Internship/Industrial Training of Students and Staff.
 - Enable students to participate in Conferences /Seminars / Contests at the national, International level / Online competition event with students .
 - Increase employability by providing technical and soft skills training
 - Technical Guidance for Lab Developments & Setups (ex. IOT, Open source Lab).

Nashik Office:
12, Guruprasad, Sneh Nagar,
Dindori Road, Nashik - 4.

Pune Office:
7, Ganaraj, Sahyadri Colony,
Pimpale Gurav, Pune - 61.

<http://mitu.in>
contact@mitu.co.in
9404684270.





- Technically sponsoring the events.
- Sharing Industry oriented-courseware and Technology.
- Create an industrial awareness among students / teaching faculties.
- Organize joint programs between industry and academicians to enhance quality of education.

TERMS AND CONDITIONS:

1. RELATIONSHIP :

- 1.1 MOU is the collaboration between two parties for mutual benefit.
- 1.2 MOU stands valid for one year from the date of agreement. The collaboration can be terminated from either side with a notice period of one month.
- 1.3 Both parties shall work in synchronism to ensure the successful completion of collaboration.
- 1.4 Both the parties shall provide adequate facilities to the students undergoing training with mutual understanding.
- 1.5 Mr. Tushar Kute will be single point of contact (SPOC) from MITu Skillologies, Nashik.
- 1.6 Dr Mrs Sangeeta Jadhav, HOD IT will be single point of contact from Army Institute of Technology, Pune (AIT), Dighi Hills, Pune-411015.

2. OBLIGATION :

- 2.1 There shall be no obligation on any party to compensate the other in any manner or to make any claim.
- 2.2 Each party shall meet the expenses as mutually agreed.
- 2.3 Each party shall respect the others intellectual property (I.P.)
- 2.4 Both parties shall maintain confidentiality about any information.

3. LIMITATION :

- 3.1 Each party represents that they have full power and authority to enter into this MOU.
- 3.2 Each party shall ensure to work together with maturity.

4. CONDITION :

- 4.1 Both parties will designate a representative who will be the primary point of contact.
- 4.2 Unless and until the parties agree there shall be no public announcement. Agreement has to be in the form of written approval.
- 4.3 Any dispute under this MOU will be settled at Pune through arbitration if necessary.

In written, where of both parties put their hard seal on the day, month and year herein mentioned.

Nashik Office:
12, Guruprasad, Sneh Nagar,
Dindori Road, Nashik - 4.

Pune Office:
7, Ganaraj, Sahyadri Colony,
Pimpale Gurav, Pune - 61.

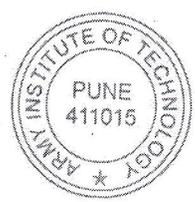
<http://mitu.in>
contact@mitu.in
9404684270.





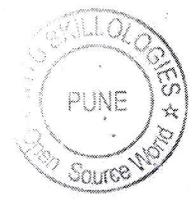
DATE: 02/Feb /2017
PLACE: Pune
NAME: Dr B P Patil
DESIGNATION: Principal, AIT
 ARMY INSTITUTE OF
 TECHNOLOGY,PUNE
ADDRESS: Dighi Hills,Pune-411015

SIGNATURE: 
SEAL



DATE: 02/Feb /2017
PLACE: Pune
NAME: Mr. Tushar Kute
DESIGNATION: Researcher
 12, Guruprasad, Sneh
 Nagar, Dindori Road,
ADDRESS: Mhasrul, Nashik, PIN
 422004, Maharashtra,
 India

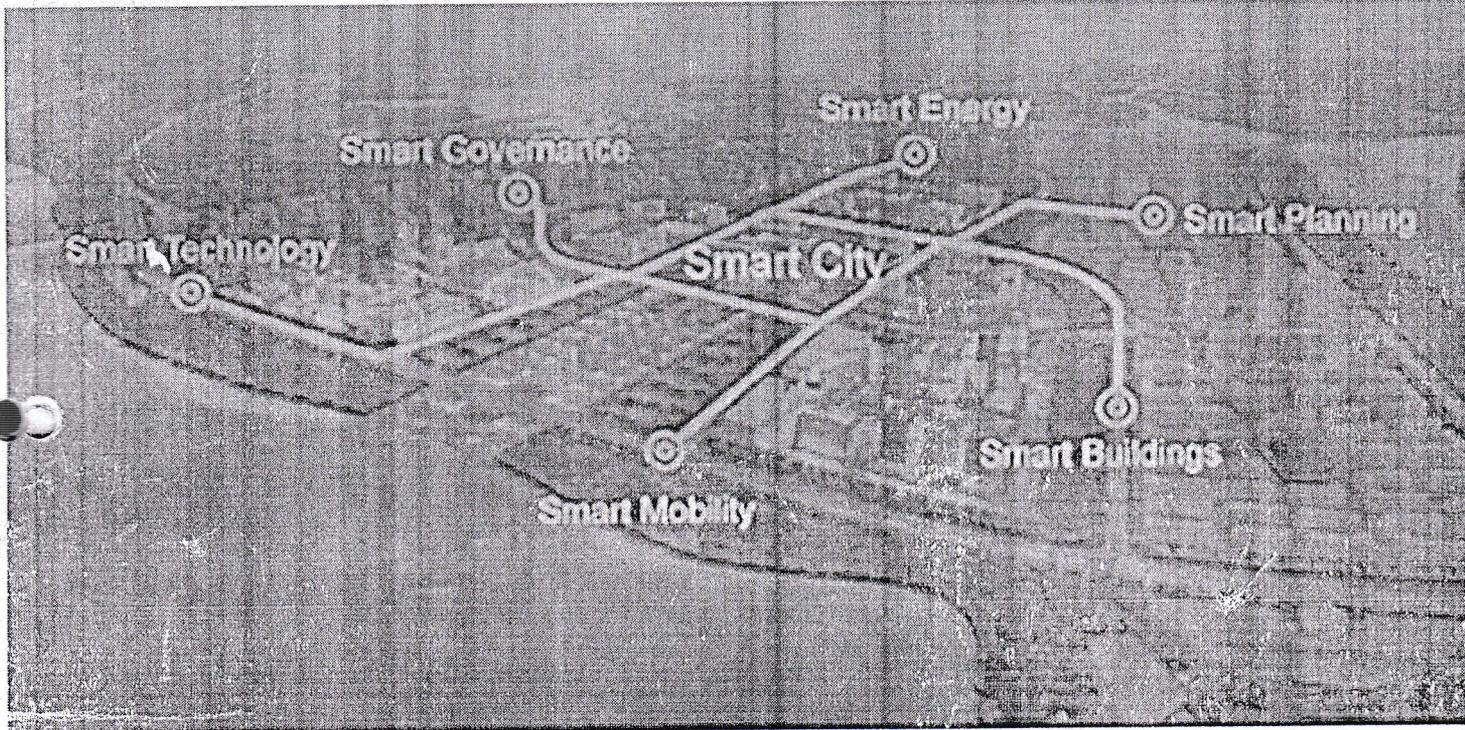
SIGNATURE: 
SEAL



Nashik Office:
 12, Guruprasad, Sneh Nagar,
 Dindori Road, Nashik – 4.

Pune Office:
 7, Ganaraj, Sahyadri Colony,
 Pimpale Gurav, Pune – 61.

<http://mitu.co.in>
contact@mitu.co.in
 9404684270.



Commercial Proposal - Build Operate and Transfer (BoT) FortyTwo Innovation lab

Submitted to,
Army Institute of Technology, Pune

Date – 30/August/2017 | Document Version – 1.0

Abstract:

Fortytwo42 Technology Innovations Private Limited also often referred as Fortytwo Labs or FT42. Fortytwo Labs is a Technology Innovation center that focuses on developing next generation cutting edge technologies in the field of cyber security, embedded systems, high performance computing and IOT. Army Institute of technology wishes to setup an innovation lab in their campus, for their students and faculties with purpose of enhancing R&D, cutting edge technology application knowledge, Industry collaboration and promote entrepreneurship. The document lays down the operational framework and commercials for same.

Proposal for Build Operate and Transfer Forty Two Labs

Document Title: Proposal for build operate and transfer of Fortytwo Innovation Lab in Army institute of technology Pune.

Document Status: 1.0

Document Publication History

Date	Author	Version	Remark
23-Aug-2017	Nilesh Dhande	0.1	Draft version for review
26-Aug-2017	Nilesh Dhande	0.2	Included commercials
28-Aug-2017	Sanjay Deshpande	1.0	Review and baseline

Reviewers

Date	Reviewer	Remarks
27-Aug-2017	Sanjay Deshpande	Included Modus Operandi

This document is proprietary and confidential. No part of this document may be disclosed in any manner to a third party without the prior written consent of Fortytwo42 Technology Innovations Private Limited.

Proposal for Build Operate and Transfer Forty Two Labs

Table of Contents

1	Introduction	3
1.1	About FORTYTWO LABS	3
1.1.1	How We Do It?	3
1.2	About Army Institute of Technology (AIT) Pune	3
1.3	Context	4
2	Fortytwo Innovation Lab	4
2.1	Objectives	4
2.2	Key Focus Areas	4
2.3	Setup	4
2.4	Operations.....	5
2.4.1	Selection	5
2.4.2	R & D / Execution	7
2.4.3	Commercialization	8
2.5	Governance Framework.....	8
3	Commercials	9

1 Introduction

1.1 About FORTYTWO LABS

Fortytwo Labs is an Innovation center that focuses on developing next generation cutting edge technologies in the field of cyber security, embedded systems, high performance computing and IOT. Fortytwo Labs is working on developing solutions to problems that has a massive positive impact on the human lives globally. Fortytwo Lab's mission is to create a radically new model of business and technology innovation life cycle management and commercialization that is primarily centered on the inventors/innovators, the entrepreneurs, founders, team members and customers to create a sustainable long-term value based innovation ecosystem.

1.1.1 How We Do It?

We identify high impact business and technology problems that have a massive impact and create dedicate teams that focus on these problems to develop the relevant business and technology solutions. Unlike Venture Capital firms, we invest in developing the intellectual property in our Labs, develop the business model, identify and work closely with the beta customers, and only after the product market fit is clearly identified, we spin-off the venture in to a separate subsidiary. We also identify third party intellectual property (Technology and Products) and bring them in to the Lab to build the necessary commercialization model around them. We work closely with academic institutes and collaborate with them to invest build cutting edge technologies and solutions that may have a slightly long-term innovation cycles. There are various Labs and centers of excellence within Fortytwo Labs focusing on specific areas of research and development. We collaborate with our co-innovation partners (enterprise customers) and jointly work with them to apply the technologies that will solve specific business/technology problems.

1.2 About Army Institute of Technology (AIT) Pune

Army Institute of Technology, Pune (AIT) is an undergraduate engineering college affiliated to the University of Pune. Only wards of army personnel are allowed admission. The admission is done through JEE MAINS exam. Vision of AIT is "AIT strives for excellence in providing the right environment for development of physical, intellectual, emotional and spiritual quotients with a view to produce total quality engineers, preparing them to face challenges of the modern information society."

1.3 Context

Consistent with their vision, Army Institute of Technology has invited Fortytwo Labs to set up and operate innovation lab inside their campus for the benefit of student and faculties with purpose of enhancing R&D, cutting edge technology and application knowledge, Industry collaboration and promote entrepreneurship. The document lays down the operational framework and commercials for same.

2 Fortytwo Innovation Lab

"Technology is nothing. What's important is that you have a faith in people, that they're basically good and smart, and if you give them tools, they'll do wonderful things with them."

- Steve Jobs

2.1 Objectives

1. To promote industry collaboration with academia, so that students and faculties understand need of a time or rather stay ahead of time.
2. To enhance knowledge of cutting edge technologies and their application/(s) in students and faculties alike.
3. To act as hub of enhanced technology research for industry.
4. To generate IP from research and development activities.
5. To commercialize IP generated in the lab.
6. To promote entrepreneurship amongst all participants.

2.2 Key Focus Areas

Below are the list of key focus areas to start with, however as we progress or based on the industry requirement/ outlook more focus areas would be added.

1. Data Science
2. Artificial Intelligence
3. Embedded Systems and Internet of Things (IoT) and
4. Cyber Security and
5. High Performance Computing

2.3 Setup

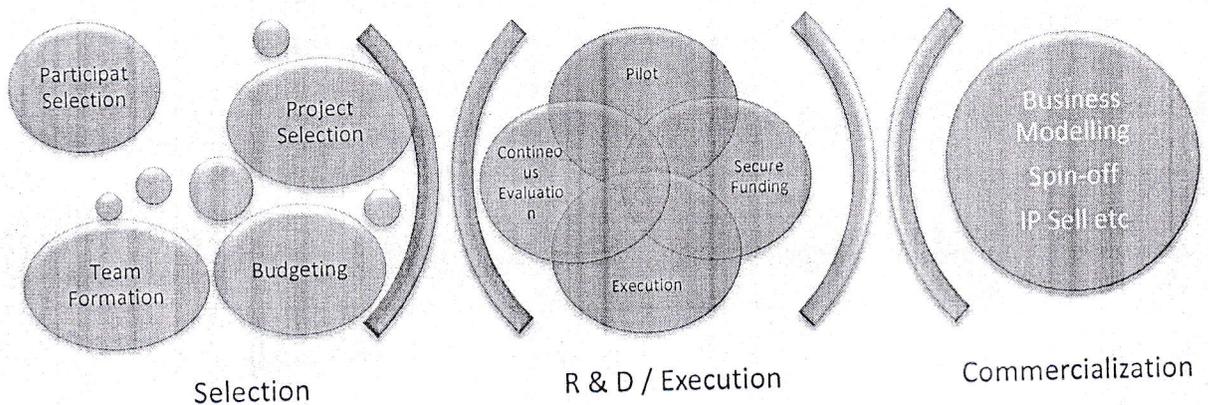
1. The lab shall be setup on the campus of Army Institute of Technology (AIT).

Proposal for Build Operate and Transfer Forty Two Labs

2. AIT shall allocate infrastructure including but not limited to space, power, internet, telephone line, machines, software licenses (if needed) and servers as per the project needs.
3. To begin with AIT shall allocate a space of 1000 Sqft – 1500 Sqft with internet connection having good bandwidth along-with 30-35 high end work stations for students and faculties to work on them.
4. The design of the lab should be in consultation with Fortytwo Labs.

2.4 Operations

The modus-operandi for the lab is depicted in following diagram. Inherently the process involved in coming out with new innovative ideas or research is a **chaotic process** with lot of **iterations and eliminations** at each phase. However, putting a method to a chaos so that it can be managed with optimum efficiency following process is typically recommended based on our experience. The following section deals with detailing each component.

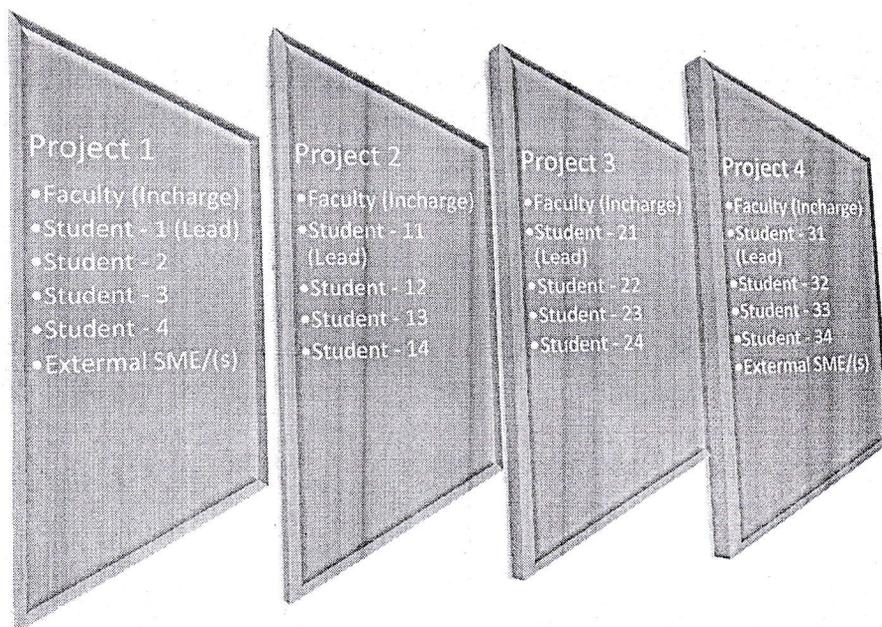


2.4.1 Selection

- Participants – This would be conducted by Fortytwo Labs and which would involve individual interaction with the program participants to judge skills, attitude and inclination.
- Project Proposals – There could be two plausible cases here
 - Case 1 - the project proposals are being submitted by the participants themselves OR

Proposal for Build Operate and Transfer Forty Two Labs

- Case 2 - Fortytwo have received the research request from industry which can be executed in AIT
- In case 2 there would be direct jump to participant selection based on the interest level and commitment shown by the participants.
- In case 1 the project proposals shall be send for scrutiny to FT42 SMEs.
- Project Selection – As the case may be out of the several project proposals received either from the participants or from industry FT42 shall choose the project based on the parameters including but not limited to IP creation, IP sales estimate, commercial viability, acceptability timeframe etc.
- Team formation – Post project selection the teams shall be formed around the project proposals to start working on same



- In each of the project team there would be a faculty in-charge and a project lead
- Faculty in-charge shall be responsible for successful execution of the project.
- Student lead is automatically selected if the project proposal is made by the particular student and same is selected and student has opted to be a lead.
- There is possibility of associating an external subject matter expert based on the project need. FT42 shall evaluate such need and post ROI analysis will associate external SMEs with the project.

Proposal for Build Operate and Transfer Forty Two Labs

- There is possibility of team rotation and attrition of team members based on their performance which would be measured on every key project milestone.
- Budgeting – The project budget shall be estimated will be submitted by the project team to FT42.

2.4.2 R & D / Execution

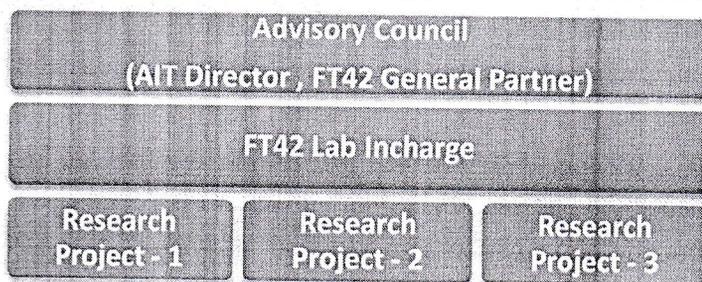
- Securing Funding – In any venture sales is an important part of entire life cycle. For securing budget each project teams shall make presentation either internally or to external industry as case may be. In case of external industry customers there would be a joint presentation done by students/ faculty in-charge and FT42 representative.
 - Sources of funds
 - There would be three sources of funds.
 - Industry Sponsored Research
 - AIT sponsored research or
 - Government funding where joint representation is made.
 - Compensation – The faculty or student compensation would be solely decided based on nature of the project and the source of funds. And hence based on above two factors faculty and student compensation would be decided.
- Execution / R&D – This would be the build phase of the project which based on the type of project guidance shall be provided to the students about the project life cycles and methodologies.
- Continuous Evaluation – The project milestones shall be tracked against the project plan submitted earlier during the project proposal phase and progress would be closely monitored by the FT42. In case of any course correction or external help needed same would be provided.
 - In case of skill gaps – the expert guidance can be made available but participants needs to ensure that they have gained basic knowledge or topic or subject so that we can make effective utilization of expert's time.
- Pilot – For the projects which are selected internally whether they are in B2C domain or B2B domain the FT42 along-with the project lead will secure pilot and/or beta customer for the project so as to get it field tested.

2.4.3 Commercialization

- There are several routes once the technology and/or product have proven to be viable in the market. Few options which are available to the teams would be
 - o Spin off – If the technology or the product is proven to be viable in the market after field testing, the researchers could choose to spin off as legal entity and start their entrepreneurial journey. FT42 shall provide assistance in terms of finding right set of seed investors, legal opinions, business acumen and last but not least initial beta customers.
 - o Industry Sponsored Research – In case of industry sponsored research project IP sell would be an option based on how the research agreement is signed with the customer. FT42 shall facilitate to provide business and legal aid for signing such agreements.
 - o Royalty – Few researchers may choose to license the technology to third party or FT42 if the technology is selected. In such cases they can get royalty if and as and when technology/ product is sold or used based on the agreement.
 - o FT42 shall be signing separate agreements on case to case basis based on what commercialization model is adopted by the researcher. The agreement may include royalty arrangements or Preferential Shares arrangement as case may be.

2.5 Governance Framework

The lab shall follow the following governance framework.



- The advisory council shall start with AIT Director and FT42 General Partner. But over the period of time the council may be expanded to include business leaders, technology leaders and domain experts from industry. The

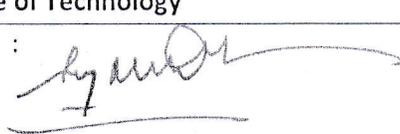
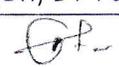
advisory council shall keep a hawk eye over the research project and provide guidance on time to time basis.

- Advisory council shall be presented with monthly report of progress of lab. The council shall meet minimum once in a quarter to access the progress.

3 Commercials

As per the MOU signed between FT42 and AIT, both parties have agreed to collaborate and seek funding opportunities jointly for furthering cause of the lab. Following are the proposed commercials for the lab.

1. The contract period would be 3 year from the date of releasing the purchase order.
2. FT42 shall charge quarterly fee of INR 90,000 (Ninety Thousand Only words) , for the value added training carried out by FT42Lab for the faculty and the students of the list attached as Appendix A,B,C. These students and faculty will increase after each year depending on the selection carried out at that time for the new batch of the students and inclusion of more faculty members depending on interest.
3. Subject to mutual agreement, AIT shall bear the project expenses, CIO meet, Tech gatherings, travel and incidentals on actuals. FT42 lab shall be taking prior approval for such expenses and may prepare budget for a year jointly with AIT.
4. FT42 may arrange for seminars and Tech gathering for external parties in AIT premises. In case FT42 decide to charge external parties; proceed of such event shall be shared in 70:30 ration between FT42 and AIT. Such events shall be free for AIT students and faculties unless stated otherwise and mutually agreed.
5. If and when external funding for research project is secured. Such funds will be first utilized for project expenses. Remaining amount will then be shared in 70:30 ration between FT42 and AIT.

On behalf of		On behalf of	
Army Institute of Technology		FortyTwo42 Technology Innovations Pvt Ltd	
By	: 	By	:
Name	: Brig(Retd.) Abhay Bhat	Name	: Mr. Sanjay Deshpande
Title	: Director, AIT, Pune	Title	:
Date	: 30.08.2017	Date	:
Witness:		Witness:	
			
1.	Prof.(Dr.) B P Patil, Principal AIT		
			
2.	Prof.(Dr.) S R Dhore, HOD,Comp, AIT Pune		

APPENDIX 'A'

Students Selected for FT42Lab

Sr. No	Intern Name	Intern Mobile	Group Members Email Id	Stream
1	Neha Jeevan	8806033237	nehajeevan28@gmail.com	TE Comp
2	Mohit Kumar Yadav	NA	asmohit@gmail.com	TE Comp
3	Vikas Singh	NA	NA	TE Comp
4	Saahil Kimar Jha	8408919727	Saahilkumarjha@gmail.com	TE Comp
5	Shivam Singh	NA	shivamsingh15123_aitpune.edu.in	TE Comp
6	Shivangi Sharma	8007679554	shivangisharma2205@gmail.com	TE Comp
7	Ritu Shekhawat	8007828676	ritukanwarshekhawat687@gmail.com	TE IT
8	Rohan Chougule	NA	NA	TE Comp
9	Y. Abhilash Reddy	NA	NA	TE Comp
10	Salil Gautam	NA	NA	TE Comp
11	Anjali Singh	7770042584	12anjalisingh66@gmail.com	TE IT
12	Anuj Singh	8291166592	NA	TE Comp
13	Sougata Ghosh	NA	NA	TE IT
14	Deeptanshu Rathore	8007815536	deep280497@gmail.com	TE IT
15	Kriti Shukla	8007683206	NA	TE IT
16	Ajay Pratap Singh	8007818956	ajaypratapsingh768@gmail.com	TE IT
17	Pushpender Singh	NA	NA	TE IT
18	Anirudh Murali	7066918164	anirudhvmurali@gmail.com	TE Comp

APPENDIX'B'

List of Students Provisionally Selected for FT42 Lab

Sr. No	Intern Name	Intern Mobile	Group Members Email Id	Stream
1	Vaibhav Yadav	8698426780		TE E&TC
2	Veer Abhimanyu Singh			SE-IT
3	Aman Tanwar	9112158227	amantanwar1996@gmail.com	TE Comp
4	G. Mothy	8698572133	gobillamothy85@gmail.com	SE Comp
5	Anant Dahiya	NA	NA	TE Comp
6	Smrithi G.S	9623394314	smrithi303@gmail.com	TE E&TC
7	Sandeep Samant	NA	NA	TE Comp
8	Abhishek Kumar	8007414273	abhishekkumar1296@gmail.com	TE - ENTC
9	Prajwal Goswami	NA	NA	TE Comp

APPENDIX 'C'

Faculty List for FT42Lab

Computer Engg.	
	Prof. Nikita Gupta
	Prof. Sagar Rane
	Prof. Mahesh Lonare
	Prof. Sarika Patil
	Prof. Shubhda Bhalerao
	Prof. Anant Kaulage
Information Technology	
	Prof. Geeta Patil
	Prof. Ashwini Sapkal
	Prof. Rahul Desai
	Prof. Vaishali Ingle
Electronics and Telecommunication	
	Prof. D G Auradkar



MEMORANDUM OF UNDERSTANDING

BETWEEN

ARMY INSTITUTE OF TECHNOLOGY

AND

FORTYTWO42 TECHNOLOGY INNOVATIONS PVT. LTD.

This Agreement made and entered into on this 22ND day of August 2017 between (hereinafter referred to as MOU) is by and between ARMY INSTITUTE OF TECHNOLOGY (hereinafter termed as "AIT") and FORTYTWO42 Technology Innovations Pvt. Ltd INDIA (hereinafter called " FT42 " which expression shall include its successors and permitted assignees) with its registered office at

1. OBJECTIVES OF THE MOU

The objective of this Memorandum of Understanding is:

- a. To set-up a FT42 Cyber Security Research Lab at AIT premises in collaboration with FT42 and AIT
- b. To promote R&D Collaboration interaction between AIT and FT42 in mutually beneficial areas.
- c. To provide a formal basis for initiating interaction between AIT and FT42.
- d. To constitute a team at both side to work on specific research areas/projects provided by FT42.

2. PROPOSED MODES OF COLLABORATION

AIT and FT42 propose to collaborate through

- a. FT42 to identify & communicate specific research areas/projects for joint research collaboration as an Initiative to the team constituted by AIT & FT42
- b. FT42 and AIT to jointly anchor with financial support and guide R&D projects, which may be carried out wholly at AIT or at premises of FT42 or partly at AIT and partly at FT42.
- c. Any other appropriate mode of interaction agreed upon between AIT and FT42.

Each of the above modes of interaction will be initiated by entering into a separate agreement between the two parties.

3. CO-INNOVATION PARTNERSHIP MODEL

AIT Roles and Responsibility:

1. Will provide existing space and equipment for the FT42 Cyber Security Lab
2. Will permit its existing students and faculty members to participate in the R&D projects executed in the FT42 Cyber Security Lab
3. Will permit its students and faculty members to participate in commercialization models (Royalty Share, Spin-Offs etc) built around the technologies.

FT42 Roles and Responsibilities:

1. Will bring in research projects from various organizations
2. Will manage the complete execution of the projects
3. Will manage and run the lab facilities
4. FT42 and AIT will jointly apply for Research Grants for various projects on a case-to-case basis.
5. FT42 & AIT will jointly bring the relevant investments to execute the projects.
6. FT42 will bring relevant industry and global collaborations to the FT42 Cyber Security Lab.

4. COMMERCIALIZATION MODEL

1. FT42, AIT, Faculty Members and Students will jointly own all IP that will be generated in the FT42 Cyber Security Lab at AIT premises.
2. FT42 will submit a BUILD OPERATE & TRANSFER proposal for managing the operations of the Lab at AIT premises.
3. A separate commercialization agreement will be signed with the relevant stakeholders on specific technologies and projects on a case to case basis.
4. AIT, Faculty Members and Students will get royalty share (licensing agreement) or preferential shares (in the spin-off) as part of the commercialization model.
5. FT42 may chose to license or sell the IP for commercialization to the Students/Faculty Members/AIT, in which case FT42 will be paid Royalty or Preferential Shares of the Spin-Off Company.

5. FORMS OF RESEARCH AND DEVELOPMENT PROGRAMS

The form of any of the said Research and Development Program (hereinafter referred to as "Research Program") will be subject to a separate Research Agreement entered into by the Parties but may also include the following:

- a. In their own existing facilities - The performance of research individually by each Party or concurrently by both Parties in mixed groups at their own facilities with regular exchanges of results.
- b. In a separate research and development facility - The performance of research by the technical personnel of both Parties working together in the facilities of one Party or in mixed groups at the facilities supported/ sponsored by either Party.
- c. Third parties - The performance of research by the Parties together with one or more third parties.

6. AGREEMENTS FOR RESEARCH COLLABORATION

For each research projects undertaken by the parties hereunder shall be initiated by the signing of a separate research project agreement between the parties, which will describe in detail:

- a. The nature, scope and schedule of the research collaboration and project.
- b. The form of the research collaboration.

- c. The estimated cost of the research collaboration together with the amount of funding, if any, to be received from third parties.
- d. The treatment of intellectual property and data rights, including patents, industrial design registration, copyrights and all other proprietary information (including innovations not patented, designs not registered etc.) which result from the research collaboration or which belong to a party and are used in research collaboration.
- e. Other provisions as may be mutually agreed upon, including provisions covering the consequences of default or termination by a participant, term, arbitration of disputes and applicable law.

7. PUBLICITY & ACADEMIC FREEDOM

- a. No press release, nor any other written statements, in connection with work performed under this Agreement intended for use in public media shall be made by either party without the other party's consent, which shall not unreasonably be withheld. In any such statements, the parties shall describe the scope and nature of their participation accurately and appropriately.
- b. The Parties acknowledge the subject matter of the Program and resulting reports can involve scientific and technological innovations in which the owner has a proprietary interest.

8. PUBLICATION

Research paper, patents and technology reports as an outcome of such a cooperation could be published jointly.

9. INTELLECTUAL PROPERTY

Ownership of intellectual property shared by the parties for the purpose of discussions held pursuant to this MOU will remain with the contributor or creator. This provision is binding on the parties and will survive the termination or expiry of this MOU. Joint funded and developed Intellectual Property Right (IPR) will be shared jointly.

10. CONFIDENTIALITY

- a. During and for a period of three years from the date of disclosure, each party agrees to consider as confidential all information disclosed by the other party in written or tangible form or, if orally disclosed confirmed in writing within thirty days of disclosure and identified as confidential by the disclosing party.
- b. The obligations above shall not extend to any confidential information for which the receiving party can prove that this information:
 - is in the public domain at the time of disclosure or comes within the public domain without fault of the receiving party.
 - is already known or become known to the receiving party
 - is received from a third party having no obligations of confidentiality to the disclosing party,
 - is independently developed by the receiving party; or
 - is required to be disclosed by law or court order.

11. INSURANCE

Each party shall be responsible for its own acts of commission and omissions and shall be liable for payment of that portion of any and all claims, liabilities, injuries, suits, and demands and expenses of all kinds that may result or arise out of any alleged malfeasance or neglect caused or alleged to have been caused by said party, its officers, employees or agents in the performance or

omission of any act or responsibility of said party under this Agreement. In the event that a claim is made against both parties, it is the intent of both parties to cooperate in the defence of said claim and to cause their insurers to do likewise.

12. NON-EXCLUSIVITY

The relationship of the parties under this MOU shall be nonexclusive and both parties, including their affiliates, subsidiaries and divisions, are free to pursue other agreements or collaborations of any kind. However, when entering into a particular research agreement, the participants may agree to limit each party's right to collaborate with others on that subject.

13. TERMS AND TERMINATION

This MOU, unless extended by mutual written agreement of the parties, shall expire 2 years after the effective date specified in the opening paragraph. This MOU may be amended or terminated earlier by mutual written agreement of the parties at any time. Either party shall have the right to unilaterally terminate this MOU upon 90 days prior written notice to the other party. However, no such early termination of this MOU, whether mutual or unilateral, shall affect the obligations of the participants under any Research Agreement, Confidentiality clause as referenced in clause 6 above, or any other agreement entered into pursuant to this MOU, which obligations shall survive any such termination.

14. DISPUTE RESOLUTION

Any dispute arising under or in connection with MOU which cannot be resolve by amicable discussion between the parties shall be referred to the President of Director or Vice-Chancellor of the respective parties of their nominees for resolution, or may be submitted to such alternative dispute resolution mechanism as may be agreed in writing between under the Prevention of Corruption Act, 1988.

15. RELATIONSHIP

Nothing in this MOU shall be construed to make party a partner, an agent or legal representative of the other for any purpose.

16. ASSIGNMENT

It is understood by the Parties herein this MOU is based on the professional competence and expertise of each party and hence neither Party shall transfer or assign this Agreement, or rights or obligations arising hereunder, either wholly or in part, to any third party.

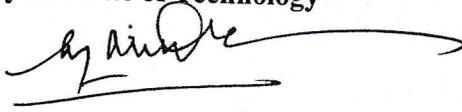
17. SIGNED IN DUPLICATE

This MOU is executed in duplicate with each copy being an official version of the Agreement and having equal legal validity. BY SIGNING BELOW, the parties, acting by their duly authorized officers, have caused this Memorandum of Understanding to be executed, effective as of the day and year first above written.

On behalf of

Army Institute of Technology

By



Name : Brig(Retd.) Abhay Bhat
Title : Director, AIT, Pune
Date : 23rd August 2017
Witness:

On behalf of

FortyTwo42 Technology Innovations Pvt Ltd

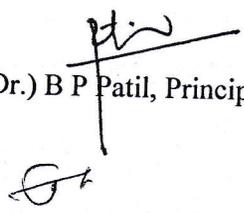
By



Name : Sanjay Deshpande
Title : Managing Partner
Date : 23rd Aug 2017
Witness:

1.

Prof (Dr.) B P Patil, Principal AIT



2.

Prof.(Dr.) S R Dhore, HOD,Comp,
AIT Pune


Nitesh R. Dhonde
23rd Aug 2017

218

Memorandum of Understanding

Between

Army Institute of Technology, Pune (AIT)

And

Credit Suisse Services (India) AG (CSSAG)



247

This MOU ("Agreement") is made at Pune on 16th day of January, 2020.

By and between:

Credit Suisse Services (India) AG: ("Credit Suisse"), a company incorporated under the provisions of the Companies Act, 1956 and having its registered office at Cluster A, EON Free Zone Plot No. 1, S. No. 77, MIDC Knowledge Park, Pune 411014, India (hereinafter individually and collectively referred to as the "**Credit Suisse or CSSAG**", which expression shall, unless repugnant to the context or meaning thereof, be deemed to mean to include its successors and permitted assigns);

Army Institute of Technology, Pune (AIT) is an engineering college run by Army Welfare Education Society, exclusively for Army and Ex-Army wards across India .AIT is accredited by NAAC (The National Assessment and Accreditation Council) in Grade A, NBA (National Board of Accreditation) and affiliated to the Savitribai Phule Pune University. Founded in 1998, AIT is ranked at 91 by National Institution of Ranking Framework (NIRF) by MHRD, Govt of India. Admission to UG level is purely based on merit of **Joint Entrance Examination (JEE)** (approved by a special Supreme Court order). It is a **non-aided and non-profit** making college

This Memorandum of Understanding (MoU) between AIT and Credit Suisse to create awareness in Finance domain and give exposure to engineering students in application of technology in Finance domain across India, the Parties desire to collaborate with each other to support and grow the training offerings.

NOW, THEREFORE, Credit Suisse and AIT (hereinafter, each individually a Party, and collectively referred to as Parties) agree as follows:

1. Credit Suisse will run one-semester elective course 'Financial Technology' for 'Computer Engineering and Information Technology' students with the help of faculty members of AIT.
2. AIT will have one or two faculty members as point of contact for the above-mentioned course for smooth execution of the course.
3. Credit Suisse will take care of the entire teaching, laboratory sessions and evaluation process.

AIT: As an EDLC AIT will have following Roles and Responsibilities



- i. AIT will prepare timetable taking into consideration availability of Credit Suisse experts
- ii. AIT will allocate one or two faculty members who will help Credit Suisse experts in conduction of lectures, laboratory sessions and evaluation of students.

Credit Suisse: Credit Suisse's roles and responsibilities are as follows

- i. Credit Suisse will design curriculum of 'Financial Technology' course (theory and laboratory)
- ii. AIT students will come to Credit Suisse and attend theory classes and laboratory session as per the timetable
- iii. Credit Suisse experts will set up question papers for tests and end semester examination
- iv. Credit Suisse experts will evaluate students based on their performance in theory as well as laboratory
- v. Credit Suisse experts will grade the students with the help of AIT faculty members

Mutually agreed upon terms:

1. This MOU shall hold good for a period of **two years** from the date of signing unless retracted by either party at any time without any liability whatsoever. In the event of retraction, both parties will use their best efforts to ensure that any developmental projects, management development programs, research studies etc., which are under way, as on the date of termination, are completed satisfactorily.
2. The activities arising out of the MoU shall be monitored every six months either at AIT or Credit Suisse premises in Pune as may be mutually agreed upon by the parties.
3. This MoU is signed in good faith as an indication of the sincere intention of the Parties to build upon and develop the mutual respect and confidence they have for and in each other. Specific understanding, if any, would be arrived at in the shape of separate Statement of Work and would be marked as an addendum of this MoU.
4. The terms of co-operation for each specific activity arising out of this Memorandum of Understanding shall be mutually discussed and agreed upon separately in writing by the Parties prior to the initiation of such activity. This MoU comes into force upon execution by the undersigned parties. By mutual consent, this MoU by itself shall not have any legal or financial obligations or implications for the Parties.
5. Any amendment to this may be made by the Parties by mutual consent, during the validity of this MoU.

Other Terms: Business

2MS

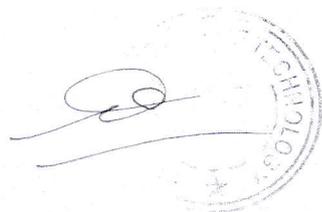
1. AIT undertake to have all AIT Students sign the "Letter of Consent" as set out in Annex C (Letter of Consent) before performing any work in connection with this MOU.

2. AIT acknowledges and agrees that it, the AIT's Affiliates, subcontractors/vendors (if any) and any of the AIT's visitors (including, without limitation, external guests and any other individuals/third parties by whatever name called, etc.), Students, in the Credit Suisse premises, shall comply with lawful requirements and instructions of Credit Suisse notified to the AIT in relation to confidentiality and are mandatorily required to sign the Annex A (Confidentiality Agreement) as annexed herewith and adhere to additional confidentiality agreements as required by local Law or applicable Credit Suisse Policies, including where such persons have unescorted access to Credit Suisse premises, access to Credit Suisse Systems or information, documents, records or data containing current, former or prospective client and customer information of Credit Suisse. AIT and/or Students shall not provide access to Credit Suisse Confidential Information including, without limitation, Credit Suisse Systems, Credit Suisse premises and other Credit Suisse information to any AIT Affiliate, subcontractor or AIT Personnel/Students and any of its visitors that have not signed a confidentiality agreement in the form of Annex A. AIT undertakes to have the confidentiality agreement set forth in Annex B (Confidentiality Agreement for Individuals) signed by AIT Personnel/ Students before they may encounter any Credit Suisse Confidential Information. AIT shall ensure that the AIT, through the AIT Personnel/Students, submit the originals of all such confidentiality agreements, duly signed, to the relevant Credit Suisse function as may be required from time to time upon request from Credit Suisse. These confidentiality agreements shall form an integral part of this MOU.

3. Prior to initiation of any court procedure, the Parties shall endeavor to settle amicably by direct informal negotiation any disagreement or dispute arising out of or in connection with this MOU. Notwithstanding anything contained in the MoU, this MOU shall be governed by and construed in accordance with the laws of India and the courts in Pune shall have exclusive jurisdiction. Any dispute relating to this MOU, shall be referred and finally resolved by arbitration in Pune, India in accordance with the Indian Arbitration and Conciliation Act, 1996, as amended ("Arbitration Act"). The tribunal shall consist of one arbitrator to be mutually appointed by the Parties, failing which the arbitrator shall be appointed in accordance with the Arbitration Act. The language of the arbitration shall be English. The decision of the arbitrator shall be final and binding on both Parties.

4. AIT covenants that it and the AIT Affiliates shall not, nor shall any of their respective officers, employees, shareholders, representatives, agents, contractors or Students ("Associated Parties"), directly or indirectly, make or offer any payment, gift or other advantage with respect to any matters which are the subject of this MoU which:

- i. would violate any anti-corruption Laws applicable to either Party or their respective Affiliates;



244

- ii. is intended to, or does, influence or reward any person, including but not limited to any CSSAG Personnel, for acting in breach of an expectation of good faith, impartiality or trust, or which it would otherwise be improper for the recipient to accept; or
- iii. Is made to or for a Public Official with the intention of influencing him or her to obtain or retain an advantage in the conduct of business.

In the spirit of this covenant, the AIT agree to limit hospitality provided to any CSSAG Personnel to reasonably priced working meals or refreshments.

AIT covenants that neither it nor its Associated Parties shall make or pay any facilitating or expediting payment in connection with this MoU to a Public Official, the purpose of which is to expedite or to secure the performance of a routine governmental action by a Public Official.

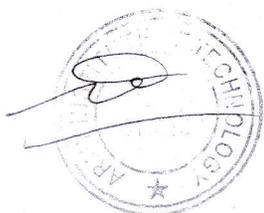
AIT represents that none of its Associated Parties is a Public Official or is acting on behalf of any governmental entity or instrumentality.

AIT shall promptly report to Credit Suisse any request or demand for any undue financial or other advantage of any kind received by the AIT or any of its Associated Parties in connection with this MoU.

Any breach of this Clause by AIT shall entitle Credit Suisse to immediately terminate this MoU by written notice to AIT.

5. Each Party shall at all times comply with applicable Laws relating to data protection in the relevant jurisdiction with respect to Personal Data. The Parties acknowledge that, with respect to all CSSAG Personal Data controlled by CSSAG and/or processed by AIT for the purpose of providing the Products or Services under the MoU, CSSAG in its sole discretion shall determine the scope and purposes for which such CSSAG Personal Data shall be provided to and used by AIT.

CSSAG Personal Data shall remain the property of CSSAG. AIT acknowledges that CSSAG maintains control over CSSAG Personal Data. Where it becomes no longer necessary for AIT to retain CSSAG Personal Data, AIT shall (at the election of CSSAG in its sole discretion), delete, destroy, anonymize or return the CSSAG Personal Data to CSSAG. AIT shall not take any of the foregoing actions without the prior approval of CSSAG. AIT shall not transfer any CSSAG Personal Data outside of, nor allow such CSSAG Personal Data to be accessible from location(s) outside of, the location(s) from which the Products or Services are provided, without the prior written consent of CSSAG. If given, AIT shall provide an adequate level of protection to any CSSAG Personal Data transferred in accordance with applicable Laws, relevant CSSAG policies and all reasonable instructions of CSSAG.



A handwritten signature consisting of stylized, overlapping loops.

243

Notwithstanding anything contained in the MoU, AIT shall be liable for use and processing of CSSAG Personal Data and undertakes to indemnify CSSAG for any breach of its obligations in this MoU or its fault or negligence in performing any of these obligations.

6. AIT agrees to maintain (and shall procure that its employees, representatives and agents maintain) the confidentiality of all CSSAG Confidential Information and not to copy, reproduce, sell, assign, license, market or otherwise transfer such Confidential Information nor disclose (other than to its approved subcontractors, subject to a written agreement requiring such subcontractors to treat Confidential Information in accordance with this MOU and designating CSSAG as an intended third party beneficiary of such agreement) or take any other action inconsistent with the confidential nature of CSSAG Confidential Information. AIT shall limit access to CSSAG Confidential Information to AIT Personnel only to the extent necessary to for the purposes of this MOU (that is on a "need to know" basis) and ensure that the amount of information disclosed to such AIT Personnel is not excessive. AIT shall advise AIT Personnel as well as any of its representatives and agents who may be exposed to CSSAG Confidential Information of such obligations.

"CSSAG Personal Data" [means any Personal Data that is disclosed or made accessible by CSSAG to AIT.]

"Personal Data" means data: (a) relating directly or indirectly to an individual; (b) from which it is practicable for the identity of the individual to be directly or indirectly ascertained; and (c) in a form in which access to or Processing of the data is practicable. In this MoU, the term "Personal Data" shall not include information or data that is anonymized, aggregated, de-identified and/or compiled on a generic basis and which does not name or identify a specific individual or person, directly or indirectly;

7. AIT represents and warrants that it has complied, at the time of signing of this MOU and shall continue to comply with, at all the times, the relevant provisions as applicable, of the Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules, 2011 and the Information Technology Act, 2000, as amended from time to time.

8. Nothing in this MoU shall constitute or be deemed to constitute a joint venture, partnership or employment relationship between the Parties. Neither Party shall have any authority or power to bind the other Party or to enter into any agreement in the name of or create a liability against the other Party in any way or for any purpose.

9. AIT shall not, without CSSAG prior written consent, use the logo / trademark / trade name of CSSAG or any of its Affiliates or Group entities at any time and in any manner whatsoever.



212

10. AIT represent, warrant and undertake to Credit Suisse that its execution, delivery and performance of this MoU has been duly authorized and neither the execution, delivery of this MoU nor performance hereunder violates or will violate any applicable Law or regulation on an ongoing basis.

Credit Suisse and AIT understand that they may share confidential information and mutually agree to respect and adhere to the Confidentiality as well as IPR requirements of the respective organizations.

A Coordination Committee consisting of Dean, AIT, Pune as Chairman, two nominees each from Credit Suisse and AIT would coordinate and monitor the academic and research programs and all related operational matters within the framework of the academic regulations of AIT and the objectives outlined by Credit Suisse.

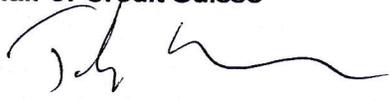
This MoU shall come into effect upon signature of both the parties on the date set forth below and will remain in force for three years. The MoU may be extended for another period on mutually agreeable terms and conditions.

For and on behalf of AIT

Signature: 

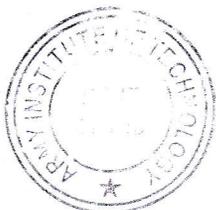
Name: ABHAY BHAT
Designation: ^{Bhat}
Director
Army Institute of Technology, Pune

For and on behalf of Credit Suisse

Signature: 

Name: Mr. John Burns
Designation:
Managing Director
Head of IT India & SFO Pune

Address:



Witness

Address:

Witness

211

Statement of Work with respect to MoU dated January 16, 2020.

A. Involvement of Credit Suisse in Programs of AIT:

Considering industry requirement and to equip students to meet the requirements, AIT and Credit Suisse have agreed to offer jointly a course viz. Financial Technology. The Financial Technology course is designed jointly by AIT and Credit Suisse to address the ever-increasing focus of the BFSI (Banking, Financial Services and Insurance) industry on technology. The course also provides adequate information to form a strong base in finance- with topics including regulatory frameworks, macroeconomics, financial accounting, corporate finance, various financial instruments etc.

This course should be considered as a beginner level course in finance, having extensive project requirements in technologies relating to the entire trade life cycle. Students will gain a competitive advantage while applying for technology roles in the financial industry after this course.

Credit Suisse has agreed to extend its expertise in content delivery and while AIT is responsible for all operational matters pertaining to the course offering including executives' travel and local hospitality. Credit Suisse has agreed to share course study material and will help faculty members to develop business case studies and course study material. Credit Suisse has agreed to continue its support for three years starting from academic year 2020-21.

For the above activities, Prof. Manoj Khaladkar from AIT and Mr. Chirag Shah from Credit Suisse will be the contact points.

For and on behalf of AIT

For and on behalf of Credit Suisse

Signature:

Signature:



Name: ABHAY BHAT

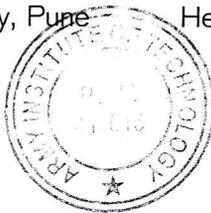
Name: Mr. John Burns

Designation:

Designation:

Director
Army Institute of Technology, Pune

Managing Director
Head of IT India and SFO Pune



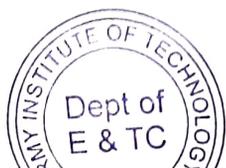
Robu Innovation Lab Schedule

Days →	1, 3, 5 (mon, wed, fri)	2, 4, 6 (tue, thu, sat)
Time ↓		
5-6pm	Weather Monitoring & Kabaddi timer	Energy Donation
6-7pm	Curtain Automation	Scoreboard Matrix & Sound Sensing Net
6:30- 8:30pm	Automatic Navigation	Automatic Navigation

Last Update – 25 March 19

***Group member needs to present in lab as per schedule irrespective of seniors present or not.*

***Update the Daily Progress in Drive and Doubts in Whatsapp for help.*



HOD  25/3/2019

Autonomous Navigation robot internal logistics

Team

1. Deepak
2. Bharat
3. Pankaj

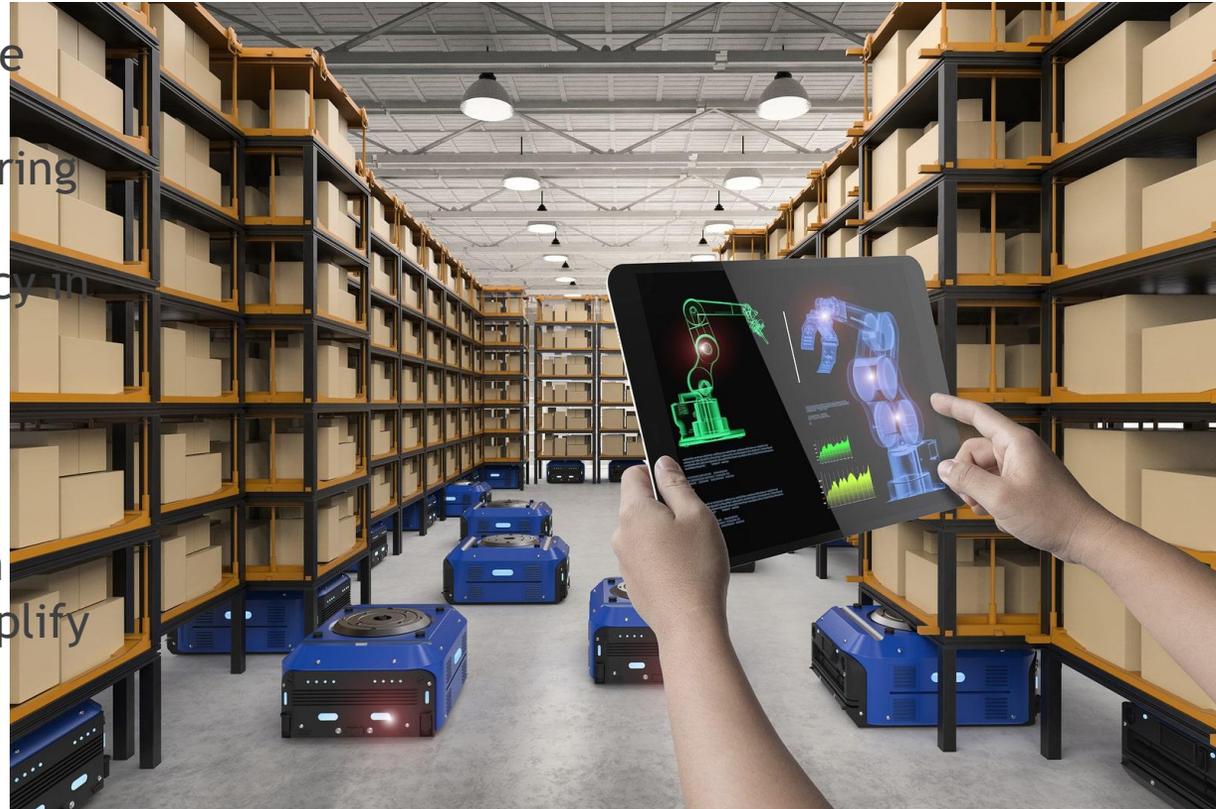
Guide: Dr. GR Patil (HoD E&Tc)

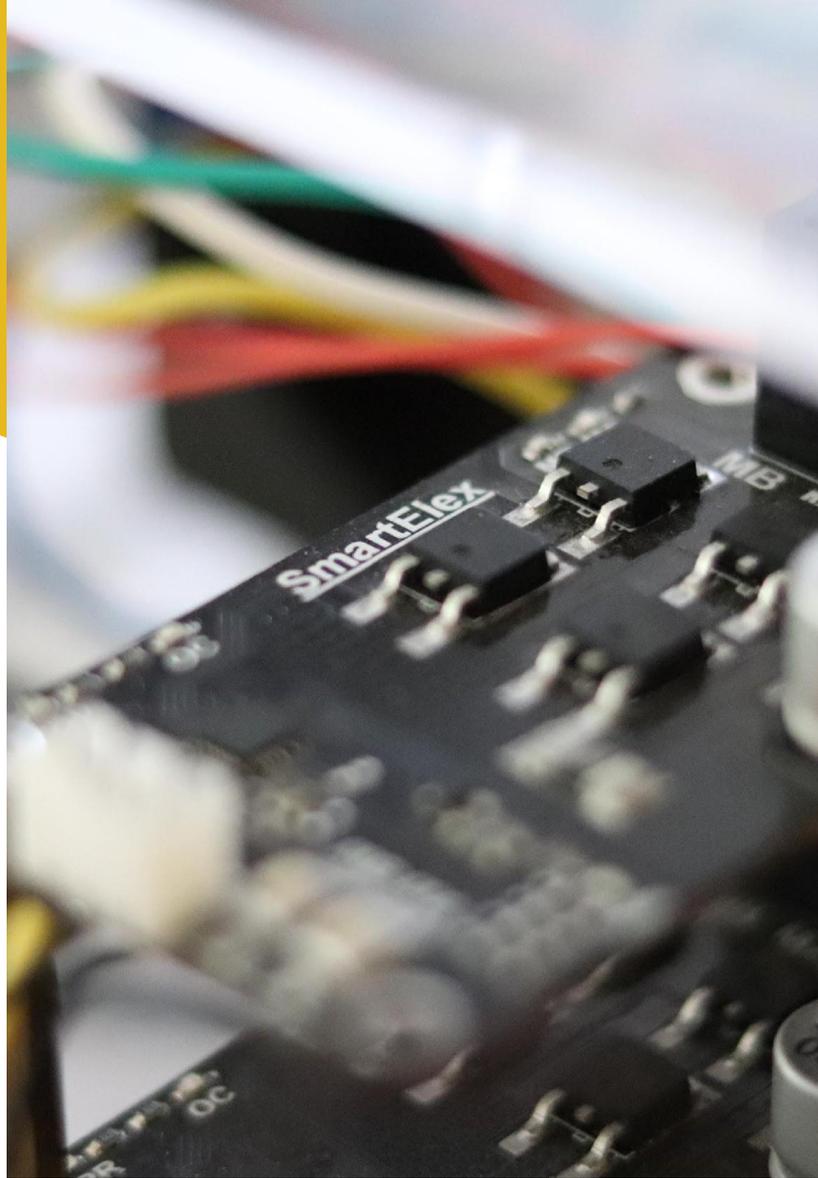


Project Description

▶ This project intends to solve the internal logistics for warehousing and manufacturing industry by using advanced technology to bring efficiency in processes.

To develop intelligent, connected Robots which can co-exist with humans to simplify the tasks and maximize the output.



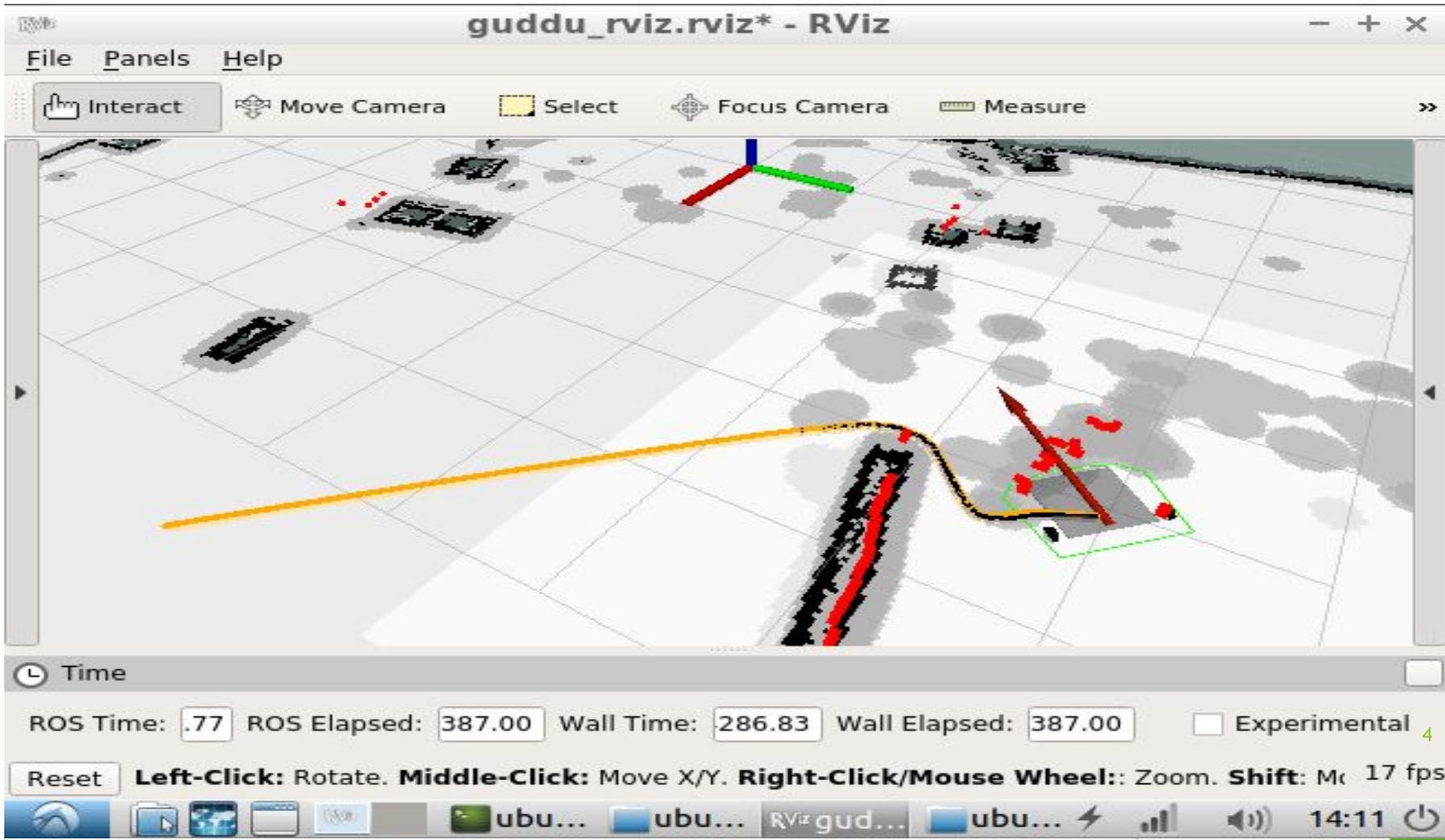


Concepts and Technology

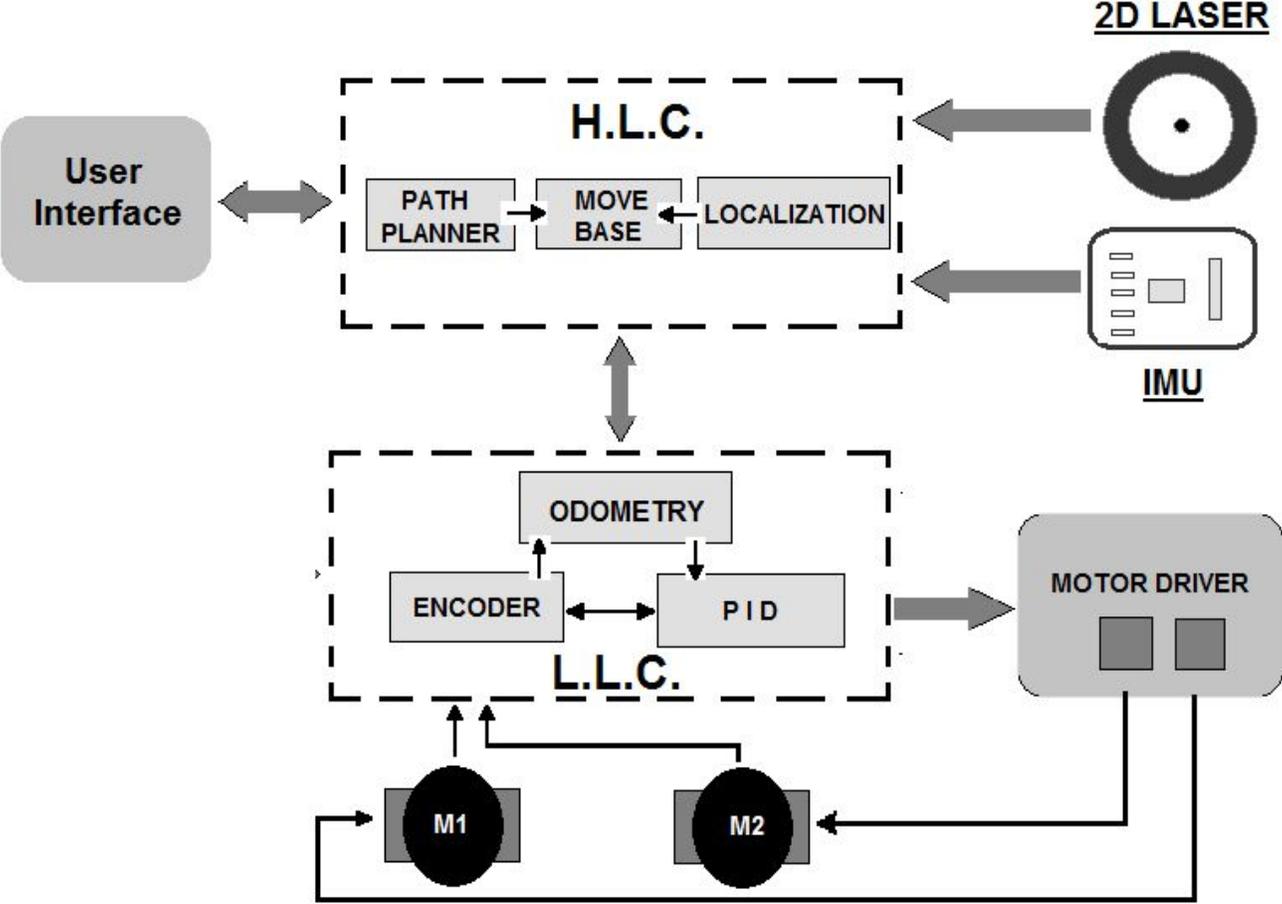
Our autonomous robots involves concepts like-

- Path planning
- Localisation
- SLAM
- Motion planning (Kinematics)
- Power management
- Web-sockets Interfaces

Simulation & Visualization



System Block Diagram



System Architecture

High level controller interfaced with LIDAR and IMU will carry out complex operations like Path Planning, Dynamic Obstacle Avoidance and generation Commands for low level controller to move to goal location.

Low level controller is responsible for real time Robot's control system, interpreting the commands by HLC in physical design. Implementing closed loop error correction and efficient algorithm for encoder pulses and odometry.

High level controller

- ▶ Robotics Operating System(ROS) Enabled system will deployed perform advanced path planning with various algorithm and accurate localization generating commands for robot control system.

Low level controller

- ▶ Robust Real time controller needed to carry out base calculations accurately and without fail.
- ▶ Control system Implementation.

Robot Design

- ▶ Differential Drive
- ▶ 100 KGs Payload
- ▶ Improved Caster Wheel
- ▶ LIDAR, IMU & Odometry
- ▶ Speed 0.8-1 m/sec



Testing



Applications



Warehousing
Robot



Manufacturing P2P
material Mover



Heavy weight
goods transfer



Office bot



Telepresence Robot



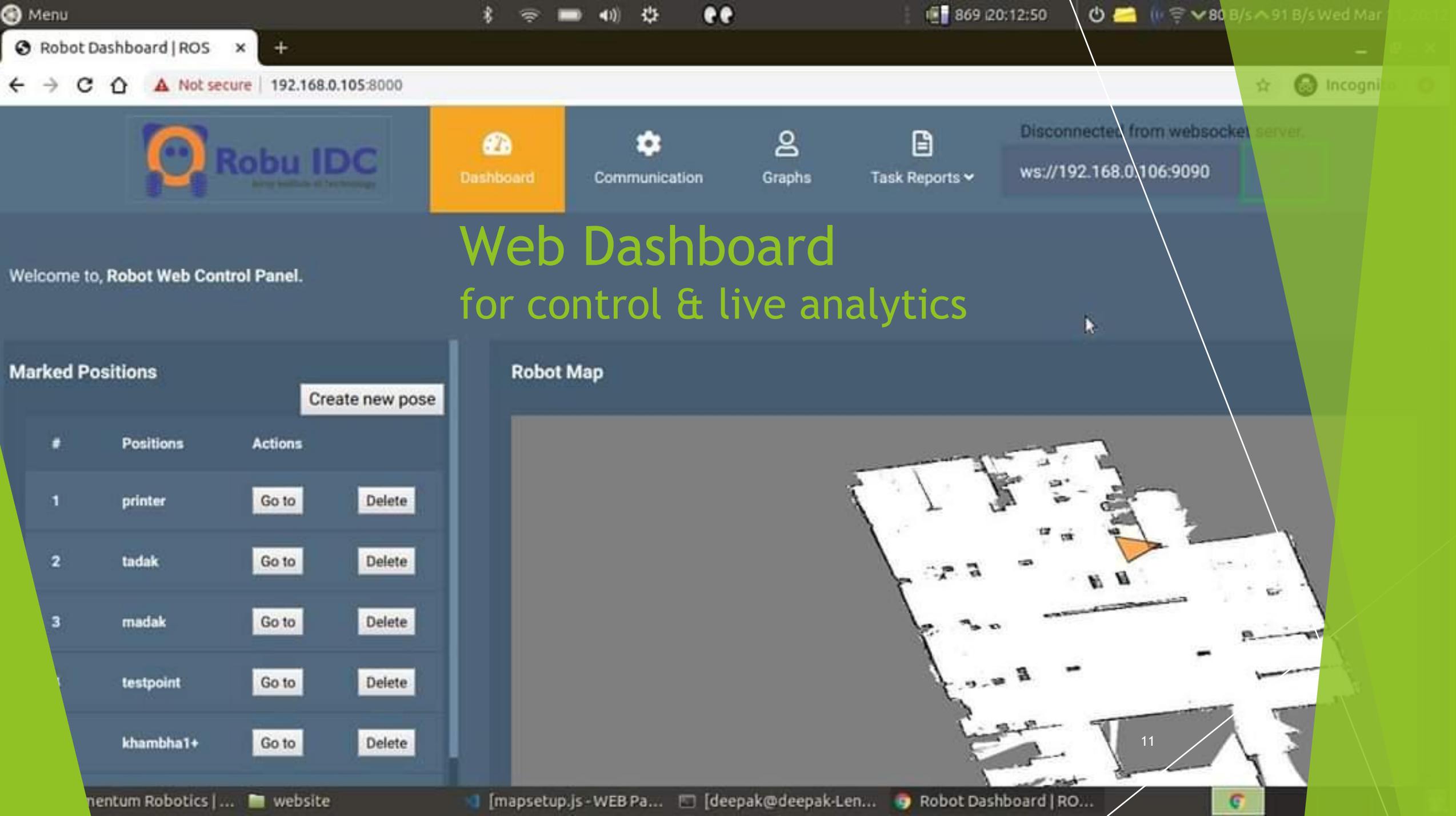
ROS



Open Source Robotics Foundation

Advanced Technologies

- ▶ We are using opensource ROS architecture for our robots.
- ▶ Implementation of SLAM (AMCL & Gmapping) and path planning (A* & TEB Planner)
- ▶ Robot is equipped with optimal path finding and Dynamic obstacle avoidance
- ▶ Localization using sensor fusion.
- ▶ WebSocket For Remote Dashboard



Dashboard

Communication

Graphs

Task Reports

Disconnected from websocket server.

ws://192.168.0.106:9090

Web Dashboard for control & live analytics

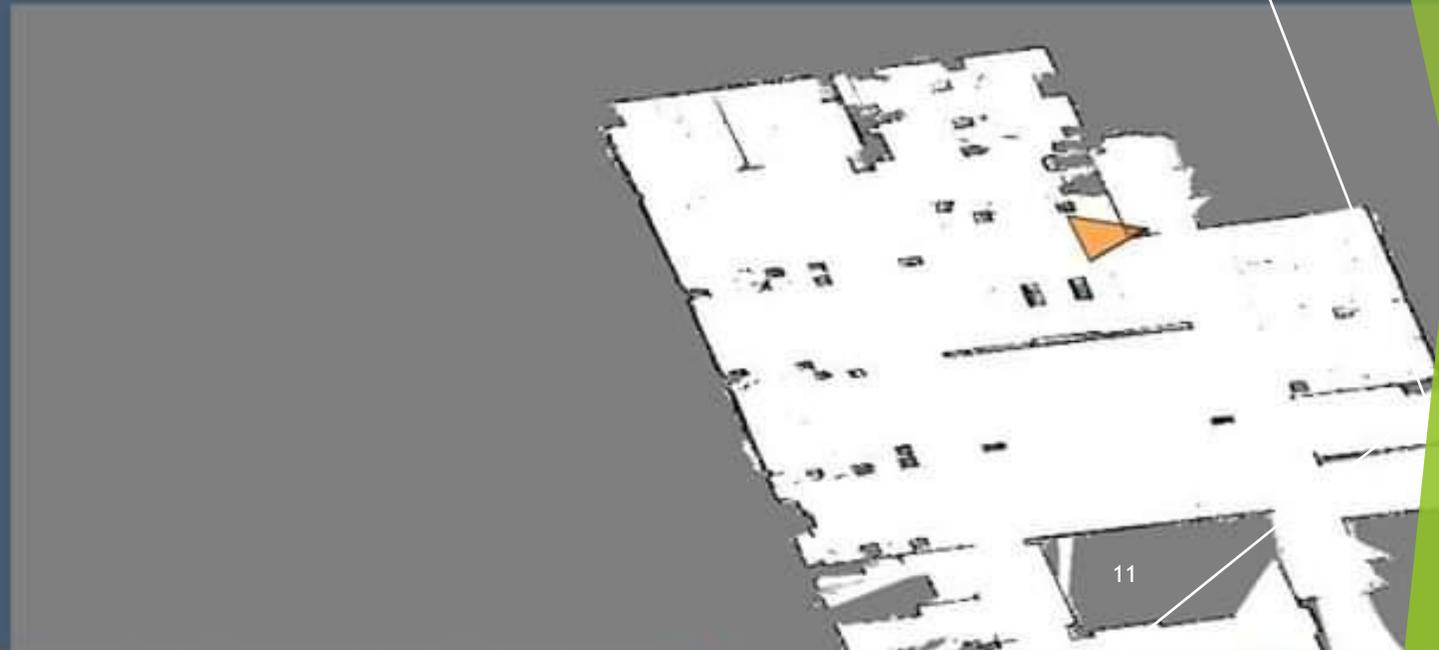
Welcome to, Robot Web Control Panel.

Marked Positions

Create new pose

#	Positions	Actions
1	printer	<input type="button" value="Go to"/> <input type="button" value="Delete"/>
2	tadak	<input type="button" value="Go to"/> <input type="button" value="Delete"/>
3	madak	<input type="button" value="Go to"/> <input type="button" value="Delete"/>
	testpoint	<input type="button" value="Go to"/> <input type="button" value="Delete"/>
	khambha1+	<input type="button" value="Go to"/> <input type="button" value="Delete"/>

Robot Map





Real Time Path Planning

Further Plans

- Development of Robotics fleet for deployment
- API Development & Integration
- Analytics Dashboard
- Multi Robot Communication
- Robots development of suitable weight category.



Thank You

Robu.in lab preparation for NBA visit

1333 Deepak Kumar yadav <deepakkumaryadav_16686@aitpune.edu.in>

Fri 2/22/2019 4:21 PM

To: H.O.D.-E&TC <hodetc@aitpune.edu.in>; Shraddha Oza <sdoza@aitpune.edu.in>

Cc: 5453 VINEET KUMAR TRIPATHI <vineetkumar_15676@aitpune.edu.in>; 1328 Bharat Prasad Dixit <bharatprasad_16701@aitpune.edu.in>; 5309 Pankaj Yadav <pankajyadav_16629@aitpune.edu.in>; 1224 MARAMREDDY <maramreddy_17031@aitpune.edu.in>; 1205 AKANSHU SONI <akanshusoni_17258@aitpune.edu.in>; 1220 KENNETH DSILVA <kenneth_17503@aitpune.edu.in>; 1150 Snehasish Pradhan <snehasishpradhan_18593@aitpune.edu.in>; 1157 Vijay Pandey <vijaypandey_18614@aitpune.edu.in>; 1119 Deepak Tiwari <deepaktiwari_18578@aitpune.edu.in>; 1260 DEVEN MALI <devenmali_18963@aitpune.edu.in>; 1123 Gaurav Mishra <gauravmishra_18558@aitpune.edu.in>; 1149 Sneha Choudhary <snehachoudhary_18385@aitpune.edu.in>; 1217 HEMANTH KRISHNA T M <hkrishnatm_17136@aitpune.edu.in>; 5450 TEJVENDER SINGH <tejvendersingh_15601@aitpune.edu.in>

Respected sir

As you are aware we have taken up few projects from various electronics domain. We are striving hard to achieve our goals with deadlines, as this is the first time experience for most of us working with electronics hardware at the product level. So it's taking more time than expected.

At the same time, we also ensure that the initiative started will surely make the department and you proud once we will achieve our goals slowly.

For the demonstration of our work during the NBA visit, we have decided to demonstrate & explain 3-4 projects, in which we have achieved some intermediate goals. we will present the same work in front you and our mentor prof Shraddha Oza on Tuesday(26 Feb 19)

You can access the live progress and documentation of all our work from a Google Drive shared Folder(Google account required). Please connect and provide your guidelines over our work.

<https://drive.google.com/open?id=1zJxy0txHkOZSGXZBqHMvLiba5fjUhFho>

Regards

Deepak Kumar Yadav

TE E&TC

Meet Google Drive – One place for all your files

Google Drive is a free way to keep your files backed up and easy to reach from any phone, tablet, or computer. Start with 15GB of Google storage – free.

drive.google.com

Projects for ROBU IDC Lab

1434 Deepak Kumar yadav <deepakkumaryadav_16686@aitpune.edu.in>

Mon 1/20/2020 5:07 PM

To: Dr Shraddha Oza <sdoza@aitpune.edu.in>; H.O.D.-E&TC <hodetc@aitpune.edu.in>; jayesh@robu.in <jayesh@robu.in>

Cc: 5411 Pankaj Yadav <pankajyadav_16629@aitpune.edu.in>; 1305 AKANSHU SONI

<akanshusoni_17258@aitpune.edu.in>; BHARAT PRASAD DIXIT <bpdprasaddixit8387@gmail.com>; sstark849@gmail.com <sstark849@gmail.com>



Robu IDC
Army Institute of Technology

Hello all,

As per our initiative, we have planned 3 projects for juniors to work as part of Robu IDC lab. These projects are extension of work and maybe a part of our study too.

Titles are-

1. **Obstacle avoidance for Mobile Robots using Ultrasonic array.**
2. **Vehicle Path Detection using OpenCV**
3. **Implementation of Web-Socket and MQTT for LAN Network.**

Students may join immediately no more than 2 in a group. they may take as mini projects and can be scaled to Final year projects.

We will mentor them timely as per our experience and support them in providing required components. Students need to be dedicated and ready to put effort on researching and studying.

This is the video link of the latest compiled work- <https://www.youtube.com/watch?v=iFbuFCKumIQ>

Regards
Deepak
AIT Pune