Memorandum of Understanding for Co-Development of Open Source Software and Designs with Internship/Apprenticeship

This Agreement is made between

Ekarshi Open Source Foundation, a Section 8 Company registered under the Indian Companies Act 1956, having its registered office at A-303, The First, Near Keshavbaug Party Plot, Vastrapur, Ahmedabad, India - 380015. Which hereinafter shall be known as **Ekarshi**, which expression shall include its Executors, Assignees and all entities claiming Right Title and Interest under the above company.

And

L. D. College of Engineering, (a Leading State Government Engineering College, located in Ahmedabad, administered by Directorate of Technical Education, Government of Gujarat and affiliated to Gujarat Technological University), having its registered office opposite Gujarat University, Navrangpura, Ahmedabad -380015 which hereinafter shall be known as **LDCE**, which expression shall include its Principal and Heads of respective departments.

Recital

1) Ekarshi is developing open source software and designs.
2) LDCE is interested in;
   a) Development of Open Source software and designs
   b) And getting their students industry ready and agrees to allow its students to join internships with Ekarshi.
3) Both Ekarshi and LDCE are interested in developing and providing open source software/libraries and designs for the Indian Industry.

This Agreement (henceforth referred to as Agreement) is entered to between Ekarshi and LDCE and this agreement incorporates the following terms and conditions regulating the Internship of Students & Intellectual Property of products / designs / modules developed by the interns during internship in the said terms and conditions are as follows:
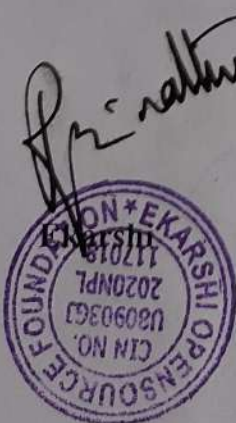
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1. **Tenure**

   1.1. This Agreement is executed at Ahmedabad on this 12TH day of FEBRUARY 2021.

   1.2. This Agreement will come into force on 12 TH day of FEBRUARY 2021 referred to as date of commencement.

   1.3. This Agreement will remain in force till 31 ST day of DECEMBER 2024 referred to as date of expiration.

   1.4. The period from when this agreement comes into force (day of   2021) till the date of expiration (day of   2024) will be referred to as the tenure of this agreement.

2. **Internship Scope**

   2.1. Development of Products, Systems, Sub-systems, Components, Modules as per Annexure C.

        2.1.1. This will include hardware, hardware designs, software, software libraries and anything derived from the same.

        2.1.2. Development of Training Systems to use, and further development of hardware, software designs, libraries and systems.

        2.1.3. All the above collectively will be called the **Internship Program**.

        2.1.4. This will include systems and sub-systems which are completed and which are in progress.

        2.1.5. The sub-systems, components, modules and libraries (as per Annexure C) will be called **Internship Program Deliverables**. These items can be used independently or can be put together to create an operational system.

   2.2. In future Ekarshi and LDCE can include other Internship programs during the tenure of this agreement.

3. **Ekarshi's Responsibilities**

   3.1. Define the project and provide all the development tools & license to develop/deliver the prototype and final modules.

   3.2. Manufacture of Internship Program Deliverables

        3.2.1. Provide the development boards, licenses so that the interns can deliver the prototypes and final modules.
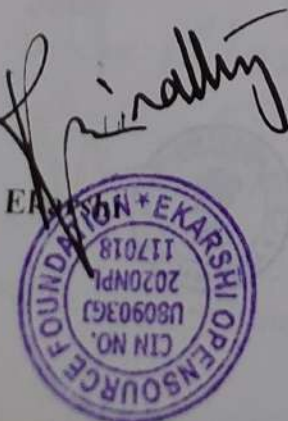
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3.2.1.1. These will be available to the intern on a returnable basis. In case they damage or lose these tools, they will be required to replace the same.

3.2.2. Provide access to simulation and prototyping software when required.

3.2.3. Provide all the Chips, Software, Electrical and Mechanical components that will be required in the Internship Project.

3.2.4. Ekarshi will arrange for funds and third party expertise to actually fabricate the Internship Project and **Internship Program Deliverables**.

3.3. Training of Interns

3.3.1. Ekarshi will provide all the training material to bring the expertise of the Intern to the point where they can deliver Internship Project.

3.3.2. This training material will cover the tools and domain knowledge of the module allocated to the Intern.

3.3.3. Ekarshi will provide technical experts who will guide the student so that they can deliver the Internship Project.

3.4. Acceptance of Module

3.4.1. Ekarshi will provide the expertise to identify when the module is available and ready to release.

3.5. Tracking and Reporting of Intern's Progress

3.5.1. Ekarshi will allocate mentors who will track and report the Intern's progress.

3.5.2. This reporting will be available to the LDCE and the Intern.

3.5.3. Interns who will work on Internship Project can show this as an industry experience and Ekarshi will acknowledge the same.

4. **LDCE Responsibilities**

4.1. LDCE will identify students who have completed 2nd year of college in the LDCE as interns.

4.2. LDCE will provide theoretical and knowledge support to the interns where and when possible.

4.3. LDCE will provide interns access to their labs for testing of Internship Project and Internship Project Components as per the LDCE's terms and conditions.

5. **Interns Responsibilities**

5.1. Each Intern will be self-trained on the tools and the domain knowledge based on the learning materials supplied by Ekarshi.

5.2. When Intern needs specific domain expertise they will need to inform Ekarshi so that such expertise can be made available to the Intern.

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5.3. The intern may need to purchase certain general purpose tools which will remain in their ownership.

5.4. The interns must do the internship work after college hours or during vacations.

5.5. Intern is obligated to report the weekly progress of their project to both Ekarshi and the LDCE.

6. IP & Design Rights:

6.1. The IP and Design Rights of the Internship Project and the **Program Deliverables** that are created will be co-owned by Ekarshi and the LDCE. And the ownership will be 50% held by Ekarshi and 50% held by the LDCE.

6.2. Both Ekarshi and LDCE agree that;

6.2.1. Ekarshi and LDCE will be joint custodians of the IPs and Design.

6.2.2. These IPs and Designs will be made freely available to any Indian University for use and further development.

6.2.3. Any Indian Company/University can request Ekarshi for Access to the IP and Design Rights on payment royalty, which will be decided by Ekarshi.

6.2.4. The use of such money received will be shared equally between Ekarshi and the LDCE.

6.2.5. Ekarshi will provide LDCE information of the entities who have requested access to Program Deliverables and the status (access allowed or denied) of the same will be informed every 15 days or at the option of LDCE.

7. Disclosures

7.1. All disclosures of Internship Project will be done strictly by Ekarshi.

7.2. Interns should and can disclose details of their internship project to LDCE appointed faculty as per the discretion of LDCE.

8. Commercials and Remuneration

8.1. Ekarshi will not be charging any type of fees or financial support from LDCE for providing internships to LDCE's students.

8.2. Ekarshi will not be charging any fees or training expenses from the interns (LDCE students) for providing them internships or training.

8.3. Reimbursement of expenses borne by Interns.

8.3.1. Pre-approved expenses borne by the Intern, which have been approved by Ekarshi will be reimbursed.

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8.4. All actual cost for the development of the Internship Project and Internship Project Modules will be borne and reimbursed by Ekarshi.

8.5. Ekarshi based on the performance of the intern, MAY offer a stipend which will be as per the Apprenticeship Act in force by the Government of India.

8.6. It should be noted by the LDCE and Intern, that the Intern will not automatically be eligible for stipend based on their appointment as an Intern on Internship Program.

9. Joint & Several Liability

9.1. Ekarshi and The LDCE will not have any liability for the use of Internship Project or Program Deliverables by any third party entity.

10. Termination or Expiration of the Contract

10.1. The Contract can be extended / terminated during the tenure of the Contract by mutual agreement of Ekarshi and the LDCE.

10.2. The Contract will stand terminated if;

10.2.1. If either Ekarshi or LDCE cease to exist as a Legal/Commercial Entity.

10.2.2. In case of the termination or expiration of the Contract.

11. General Terms and Conditions

11.1. This Contract shall be governed by the Laws of the Union of India in force at the time of execution and tenure of this contract and the jurisdiction for any enforcement will be Ahmedabad.

11.2. No party in the Contract will have the right to assign or transfer the interest right or liability in the Contract without the written consent of the other party.

11.3. The parties of the Contract can mutually change clauses of this Agreement. Any such change unless explicitly indicated will be limited to the clause so modified/added/deleted.

11.4. The Contract shall be signed in Duplicate with each party keeping one original copy.

11.5. The parties to this agreement shall sort out all disputes between themselves through a mutually acceptable arbitrator.

For Ekarshi

Date

Director 12/02/2021

Ekarshi

For LDCE

Date

Principal

LDCE

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12. Annexure A: Internship Program

12.1. Open Sourced Modular Autonomous Multi-Axis Mobility Controller (MaMaMoCo).

12.1.1. MaMaMoCo modules will be used to develop Autonomous Aerial/Marine/Land Vehicles.

12.2. Develop modules for control units and sensors

12.3. Support systems like Power Systems to be used by Multi-Axis Mobility Controller.

13. Annexure B: Domain Expertise that the Interns will be working on;

13.1. Control/PID

13.2. Fuzzy Logic Systems

13.3. AI/ML in Mobility + Control

13.4. DSP

13.5. Embedded Module Design

13.6. Communication Fundamentals

13.7. Fault Tolerant and Fail Safe Modules/Sub-Systems

13.8. Tools

13.8.1. Matlab/Simulink

13.8.2. C for implementing Embedded Systems

13.8.3. Arduino IDE

13.8.4. Microchip PIC18F Q43 MCU

13.8.5. ARM based MCUs

13.8.6. LLVM based development of RISCV (SHAKTI Processor) and SPARCV8 (AJIT Processor).

14. Annexure C: Modules (of Internship Program Deliverables) that Interns will be delivering

14.1. Real Time Control Module

14.1.1. MaMaMoCo real time control module

14.2. Motor Control Modules

14.2.1. BLDC

14.2.2. Servo Motors

14.2.3. Stepper Motors

14.3. Sensor Acquisition Modules

14.3.1. Inertial Measurement Units

14.3.2. Altimeters

14.3.3. LIDAR Sensors

14.3.4. Depth Gauge

14.3.5. Wind Speed Measurement Sensors

14.3.6. Angle of Attack Sensors

14.4. Battery Management

14.4.1. Battery Condition Monitoring
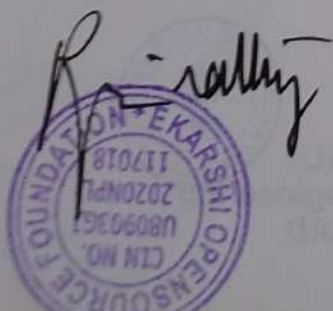
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14.4.2. MOSFET Driver Modules
14.4.3. IGBT Driver Modules
14.4.4. Inverter Modules (1 Phase and 3 Phase)
14.4.5. Li-Ion Charging Systems
14.5. Communication Modules
14.5.1. SDR based Simplex and Duplex Communication Systems
14.5.2. SONAR (for marine)
14.5.3. FHSS
14.5.4. Encryption Systems
14.6. Note: This list will be updated as per the needs of the project and end-use.

15. **Annexure D: Modules (of Internship Program Deliverables) will be delivered using the following architecture;**
    15.1. 8 bit based on PIC18FQ43
    15.2. 32 bit based on PIC SAM D10
    15.3. 32/64 bit based on SHAKTI Chromite Processor
    15.4. 32 bit based on AJIT Processor

16. **Annexure F: Ekarshi will provide**
    16.1. C Training
    16.2. Training on Microcontrollers identified in Annexure D
    16.3. Expertise to use the IDEs with these microcontrollers
    16.4. All the Development Kits/Platforms, Develop Licensing, Testing modules and Prototyping facilities for the Processors/Computing Systems.
    16.5. Domain Expertise to implement the modules as per Annexure C
    16.6. Active Mentoring for coding and module delivery.
    16.7. Interns will be supplied the following on a case to case and need basis
        16.7.1. Digital Oscilloscopes
        16.7.2. Test Benches and Test Rigs
    16.8. All the sensors and components to prototype the systems.
    16.9. Expertise to optimize the Designs and Libraries
    16.10. Testing and validating the Designs and Libraries
    16.11. All the ICs/Chipsets that will be used during the development phase.
    16.12. And will arrange for PCB design and Assembly of components for the prototyping and final design.

17. **Annexure G: Institute will provide**
    17.1. Institute will provide academic support and student access to its Laboratories.

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18. **Annexure H: Fabrication Tools to be used by Interns**
   18.1.   Laptops with 8 GB RAM or more.
   18.2.   Interns will arrange their own fabrication tools like;
       18.2.1.   Multi-meter
       18.2.2.   Breadboard + General Purpose PCBs,
       18.2.3.   Soldering Iron
       18.2.4.   GP Boards

12/02/2021

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In presence of

HOD
EC

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Electronics & Communication Engg. Dept.
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