Team Name : THE SHADOW MODE

	Name	Branch and Semester	Contact Number	Email- ID
Team Leader	Mayur PL	Electronics & Instrumentation 6th semester	9972479506	plmayurs@gmail.com
Member 1	-	-	-	-
Member 2	-	-	-	-
Transaction ID (anju.marina.lobo@oksbi)	P2002232236441771459232			

Note:

1. One can participate either as a part of a team or an individual basis. Switching teams is not allowed.
2. The uploaded ideas will be screened to go to the second round.
3. Judging : competition entries shall be judged, or winners selected based on the following criteria
   - Is the problem worth solving
   - How innovative or novel is the idea
   - Scientific accuracy
   - Social impact
   - Scalability
4. Decisions of IIC JSSSTU in respect of all matters to do with the competition will be final and no correspondence will be entertained.
5. In second round, the selected teams will have to present their idea in front of the jury panel.
6. Payment of INR 50 should be made to the UPI ID **anju.marina.lobo@oksbi** and submit the transaction ID above.
7. Idea should be submitted in **.pdf** format.

Abstract: **(not more than 150 words)**

Considering a grocery shop/supermarket in cities, almost all products come with packing. Most of them is not re-usable. Even though recycling is the only option left, it is highly difficult job, if they are mixed/dumped with every possible kind of waste generated in cities. Since it is not happening to make every people segregate the waste while dumping, waste segregation in the huge plant is the very difficult yet important job.

Usually the segregation process is done manually by human workers wearing masks yet directly exposing to toxic gases. Having normal robots with joystick control is hard to operate efficiently. The proposed solution solves this problem by Robotic arm controlled or imitated remotely by human arms. The System uses MEMS IMU to read arm gestures, and uses many servo motors to mimic the human arm. The system also uses the robotic principle - Kinematics for accurate movement of the arms.

Introduction (not more than 200 words)

One of the main goals of applying Robotics to municipal waste separation is to avoid non bio degradable waste materials ending up in landfills.

Manual waste segregation by humans wearing a mask or protective clothing is uncomfortable, highly demanding work and dangerous for the worker's health. where workers separate waste into categories. This involves direct contact with waste, standing up, and the related discomfort of noises and smells associated with waste. It is physically and mentally exhausting job that involves ergonomic problems associated with the physical load causing repetitive stress injury, potential blows/cuts from the objects.

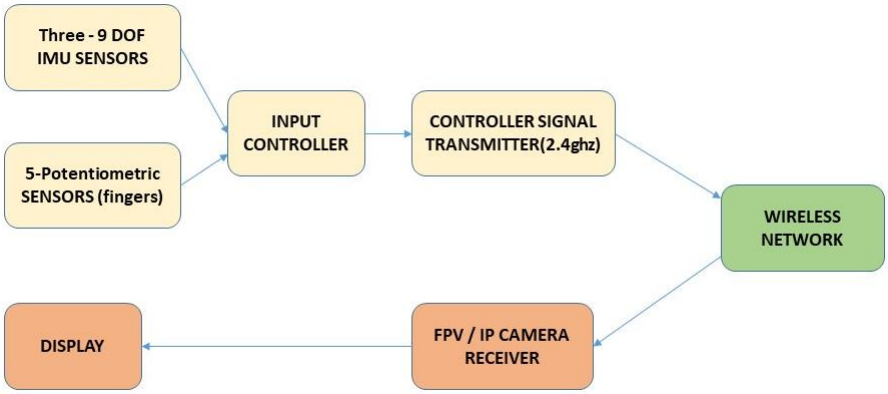
The proposed system has Sensing Part which is the arm sleeve that senses hand movements precisely and transmits the motion data to the robotic arm through wireless network. The Actuating Part receives the motion data of the worker, and actuates servo motors of the robotic arm to replicate the movements in real time. The system also has FPV camera and display system to guide the controller(worker) to pick from where exactly he/she wants and segregate to where exactly he/she wants and Machine Learning to reduce need of manpower. The necessity of the system plays a major role in the 'Swatch Bharath Mission'.

Motivation (not more than 100 words)

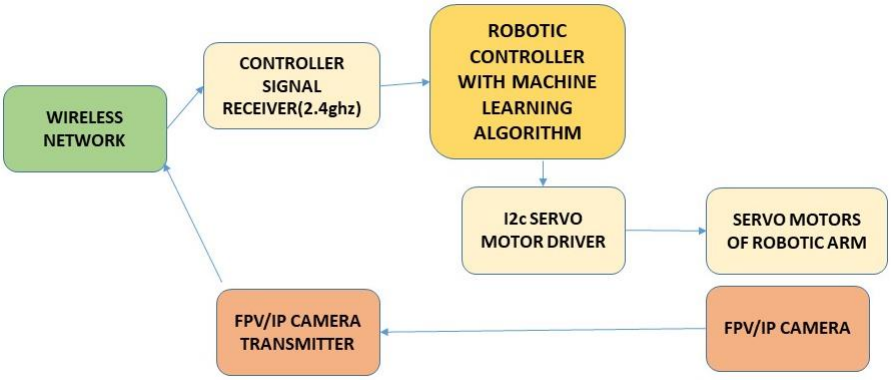
- The concept of a Hollywood Movie – REAL STEAL,
  Where 'The Humanoid Robot – ATOM' mimics the real(human) boxer's moves in real-time to fight against another Humanoid Robot. The concept used is Shadow function (reading human moves and replicating by humanoid robots)
- Waste segregation being done manually by human workers in MYSURU WASTE SEGREGATION PLANT, wearing masks while exposing to toxic gas.

Methodology (block diagram, related figures etc)

The Sensing Part



The Actuating Part



Social Impact

- **No Direct Human Interaction with the Waste Plant to save worker's health.**
- **Minimizing Hazardous waste getting exposed to environment.**
- **Minimizing non-biodegradable waste ending up in Landfills.**

Market Survey

After the initiation of 'SWATCH BHARATH MISSION', and the Waste Management Plant problems, most of the cities of India are considering segregation of waste is really necessary.