*RoboCupJunior 2022 OnStage*

Technical Description Paper

**Team Information**

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| **Team Name: Hu-More-Bot** | |
| **Country / Region: Hungary, Nyíregyháza** | |
| **Do you need a translator? If yes, in what language? :** | |
| * Yes or ☐ No. Language: Click or tap here to enter text. | |
| **Has your team read the 2022 OnStage and RoboCupJunior rules and scoresheets?** | |
| * Yes or ☐ No. | |
| By selecting “Yes”, you confirm that you have read the rules for competition, you understand them and agree to fully comply with them. These can be found at the official website (http://junior.robocup.org). If in doubt, please access the site and download the latest one. | |
| **The Participants Name and their Technical Role:**  What are the roles of each team member? Please indicate each team member's name and their role. We would like to know how you contributed to the project as a team member. | |
| **Member 1:** | Virgo Sámuelteamleader, mechatronic |
| **Member 2:** | Fenyvesvölgyi Zétény programer |
| **Member 3:** | Szalacsi Máté mechanic, spokesman |
| **Member 4:** |  |
| **Member 5:** |  |

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| **Photo of Stage Area and measurements (Virtual Competitors only):** |
| Stage Width:Click or tap here to enter text. Stage Height:Click or tap here to enter text. Click or tap here to enter text. |

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| **Collaboration:**  Please link any team websites or online depositories for open source learning and continuing development.  It is always important to share our expertise and learning. RoboCup is a great way to learn more, share your experience and aspire to new project goals. Learning opportunities are the ultimate goal of the RoboCup Community. |
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**Technical Information [500 Words Per Paragraph]**

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| **Overview:**  What is the theme of your project? If you made multiple robots, please describe them below (the number, kinds of robots, etc.). |
| Everyone is looking for the most important things in their life. Everyone has to fight for happiness, talent and knowledge because knowledge, talent and happiness is not given cheaply. |
| **Mechanical Design:**  Detail all the ingenuity that the team has made to realize difficult movements of the robot, such as moving smoothly, keeping balance, grasping objects, and so on. Include photos of designs and models (CAD/CAM models etc.). |
| We used five robots, three of which were self-developed and two were alpha bots.  Pig1: -Mechanical system: The frame is self-designed in Tinkercad and 3d printed with Ender 3 printer. We used two dc 3-volt hobby motors and two wheels for the motors.  -Electronic system: Arduino unos and Adafruit motorshield v2 were used to control the electronic components (motors). This was programmed in C ++.  -Control system: The whole robot is controlled by a Raspberry Pi 4 which is programmed in python.  Pig2 and Pig3: These robots are not self-designed instead they use prefabricated parts.  -Mechanical system: The robot has two dc 3-volt hobby motors with a plastic base, a 3d printed top and we used the robot‘s motherboard to secure the parts.  -Electronic system: An Arduino uno is responsible for controlling the motors.  -Control system: A Raspberry Pi 4 is responsible for controlling the entire robot.  Rooster: -Mechanical system: The frame is self-designed in Tinkercad and 3d printed with Ender 3 printer. We used two dc 3-volt hobby motors, as well as an sg90 servo motor.  -Electronic system: -  -Control system: Raspberry pi zero 2 w and Arduino mega 2560.  Server robot: -Control system: Raspberry Pi 4 model B |

**Microcontrollers:**

Indicate the name and kind of controller(s) you are using. For example: NXT, Arduino, Raspberry Pi, EV3, etc.

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| **Sensors:**  Which sensors are you using? For example: Touch, Light, Sound, Rotation, Shaft encoder, Compass, Proximity, Ultrasound, Color, Compass, etc. |
| We’re using Rsapberry Pi cameras and infrared distance sensors. |
| **Materials:**  Detail any materials used in constructing robots, including the purpose of weight reduction, strength preservation, improvement of finish, etc. |
| We’re useing a self designed 3d printed frame. |

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| **Electrical/Electronic Design:**  Have you developed your own electronics? For example, motor controllers, voltage regulators, amplification circuits, etc. Include photos of custom board designs (schematics, board layouts etc.). |
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| **Wireless Communication:**  Are you using wireless communication(s)? If so, what type? No team is allowed to use Wi-Fi. Please refer to the Official RoboCupJunior OnStage 2022 Rules. |
| We’re useing bluetooth communication. |

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| **Power Management:**  What kind of battery is built into/used in your robot? Please clarify the name and type of battery, together with current and voltage. (Teams should comply with the Official RoboCupJunior OnStage 2022 Rules). What measures are you using to regulate your power supplies? |
| We use a 2 cell lipo battery and five 18650 batteries. |
| **Programming Language:**  What programming language(s) are you using? Are you using any libraries/datasets? You may wish to add a link to your GitHub repository. |
| C++ and Pyton |
| **Sources:**  Please provide links to any manuals, documentation or open source repos used in the development of the project. |
| These are the books that we used.  <https://www.amazon.com/Beginning-Robotics-Raspberry-Pi-Arduino-ebook/dp/B08Y7K58DW>  s  <https://www.amazon.com/Arduino-Projects-Book-Scott-Fitzgerald/dp/B07G4PV9WS> |

**Performance Information [1000 Words Per Section]**

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| **Features:**  An OnStage Performance must showcase the implementation and integration of robotic features in ways that visually enhance or add value and contribute to the theme or story being portrayed. Consequently, teams must present four of what they believe are their robotic features: for example system/sensor integration, electromechanical design, interaction or software solutions implemented on their robot(s). The aim should be to present the integration of the chosen features and how the features contribute to the progression of the performance. |
| Everyone is looking for the treasure that is most important to them, which the acorns symbolize in the scene. Each piglet searches for its own treasure by overcoming a series of obstacles. To orient the piglets, they are all equipped with a camera and communicate with each other via bluetooth. |

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| **Interaction:**  Do you interact with the robot? (i.e. human to robot, robot to robot interaction) If so, how? |
| The robots communicate with each other via bluetooth. |
| **Integration:**  How do you use your sensors, actuators and robot(s) to create a cohesive performance? Are you using multisensor systems? Do the robots rely on each other during the performance? |
| Click or tap here to enter text. |

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| **Challenges and Difficulties:**  What challenges and difficulties has the team encountered? How did you overcome them? If you did not, what would you do if it happened again? |
| The first challenge was to solve the robot communication. The second was that the robots had to find their way through the obstacles.  The third challenge, then, was to synchronize the robots to move at the same time. The fourth is that the camera is also used for orientation. |

**Appendix [Limit to 5 pages - excluding code]**

# Photos and Images of the robot(s):

If there is a design drawing of the robot, or if you have photos or notes of the development process, please provide them. Those will be useful to show and prove that the team's robots and designs are their own. If you are including photos or documents, please ensure that they fit within five sheets of A4 size paper.

Click or tap here to enter text.

# Main code for robot(s):

Please attach the latest version of your code for each of the robot(s). The code is allowed to be modified after submission and will not be used during the judging process, only to inform the judges of the team’s skill level and the programming language.

Click or tap here to enter text.