| Project Name | Turtlebot Fleet Management |
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| | |
| Online team meeting | https://fau.zoom.us/j/65679458667 |
| | |
| Production system (if any) | ... |
| Test system (if any) | ... |
| | |
| GitHub repository | https://github.com/amosproj/amos2022ss03-turtlebot-fleet-management |
| GitHub kanban board (project) | https://github.com/amosproj/amos2022ss03-turtlebot-fleet-management/projects/1 |
| | |
| Team T-shirt (white) | ... |
| Team T-shirt (black) | https://www.shirtinator.de/loadBasket/Gip4U1-D_O7 |
| | |
| Additional materials | ... |
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| Last Name | First Name | GitHub User Name | Email Address |
|---|---|---|---|
| Vogler | Tim | cat24max | tim.vogler@fau.de |
| Scherbel | Sebastian | Sebastian2023 | sebastian.scherbel@fau.de |
| Petersen | Jonas | JonasPetersenFAU | jonas.petersen@fau.de |
| Blöcher | Meike | MeikeBloecher | meike.bloecher@fau.de |
| Markert | Niklas | nmarkert | niklas.markert@fau.de |
| Ramaiya | Umang Bharatkumar | UmangBR | umang.ramaiya@fau.de |
| Janjua | Muhammad Usman | usmanjanjua786 | usman.janjua@fau.de |
| Moorthy | Venkatesh Kumar | Venkatesh770 | venkatesh.kumar.moorthy@fau.de |
| Alekseenko | Ekaterina | ekaterinaaleksee | ekaterina.alekseenko@fau.de |
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| **Goals** | Achieve goal of industry partner |
| | Foster and atmosphere of learning |
| | Everybody has to have fun during the course |
| **Meeting norms** | Eveybody shows up on-time (Wednesday 12:30 pm) |
| | Meeting with business partners is once a week |
| | We do not interrupt each other |
| | There shall be a friendly atmosphere |
| | We are fair to other team members (pair programming,...) |
| | Every idea is welcome |
| **Working norms** | Everyone contributes regularly |
| | We take criticism positively and try to learn from it |
| | We value quality over quantity |
| **Coordination norms** | Every job has a responsible person |
| | We volunteer for jobs |
| | The responsible person has to be marked in the feature board |
| | Job assignment: First come, first serve! |
| **Communication norms** | We follow the Chatham house rules |
| | We use Slack for formal infos to the team & Whatsapp for informal information |
| | We check Slack at least once a day |
| **Consideration norms** | We discuss disagreement openly |
| | We vote for a final resolution |
| | Everyone has the same voting rights |
| **Cont. improvement norms** | We jointly review the happiness index |
| | You must raise insufficient quality issues |
| | Everybody has to send a stand-up mail at least twice a week |
| | We fill out the happiness index at the end of the meeting |
| | A continous improvement has to be visual |
| **Rewards** | We celebrate a succesful release |
| | After a successful sprint release with use clapping reaction on Zoom |
| **Sanctions** | You must raise clear violations of the team contract |
| | Consequences for violations of the team contract are discussed by the team |
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| # | Meeting Day | Uni | Comment | Product Owner | Software Developer | Release Manager | Scrum Master |
|---|---|---|---|---|---|---|---|
| 1 | 2022-04-27 | | | Umang Ramaiya/ Jonas Petersen | Everyone else | N/A | Ekaterina Alekseenko |
| 2 | 2022-05-04 | | | Umang Ramaiya/ Jonas Petersen | Everyone else | N/A | Ekaterina Alekseenko |
| 3 | 2022-05-11 | Yes | | Umang Ramaiya/ Jonas Petersen | Everyone else | Tim Vogler | Ekaterina Alekseenko |
| 4 | 2022-05-18 | | | Umang Ramaiya/ Jonas Petersen | Everyone else | Meike Blöcher | Ekaterina Alekseenko |
| 5 | 2022-05-25 | Yes | | Umang Ramaiya/ Jonas Petersen | Everyone else | Sebastian Scherbel | Ekaterina Alekseenko |
| 6 | 2022-06-01 | | | | ... | ... | COACH student |
| 7 | 2022-06-08 | Yes | Mid-term due | | | | COACH student |
| 8 | 2022-06-15 | | | | | | COACH student |
| 9 | 2022-06-22 | | | | | | COACH student |
| 10 | 2022-01-13 | Yes | | | | | COACH student |
| 11 | 2022-01-20 | | | | | | COACH student |
| 12 | 2022-01-27 | | | | | | COACH student |
| 13 | 2022-02-03 | Yes | | | | | COACH student |
| 14 | 2022-02-10 | | Demo day! | | | | COACH student |
| 15 | 2022-02-17 | | Retrospective | | | | COACH student |
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| Product Vision | Project Mission |
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| The vision is to have a management system which helps fulfill daily tasks in a smart and intelligent way. TurtleBots are automated guided vehicles (AGVs) which assist humans without their intervention. The TurtleBot fleet management system is envisioned to bring intelligence to a fleet of these AGVs. It manages every robot to increase efficiency effectively. | The mission is to develop three key components namely, a fleet management system, an on-robot navigation system and a user interface along with interfaces to have an intra-component communication. The fleet management system has to manage TurtleBots (AGVs) on a defined circular course. The TurtleBots need to communicate with the fleet management using MQTT & VDA5050 and should navigate in the available physical space to deliver small goods from a home station to a particular station on a pre-planned route and reorient themselves when going off-course. An interactive user interface should provide status information for every robot. |

| Term | Definition |
|---|---|
| Sick LiDAR LOC | A software for determining the position of automated guided vehicles (AGVs) |
| SMET | Sick Map Engineering Tool: helps create maps for localization |
| ROS | Robot Operating System, a framework that helps researchers and developers build and reuse code between robotics applications |
| MQTT | A lightweight, publish-subscribe network protocol that transports messages between devices |
| VDA5050 | A standardized interface for AGV communication |
| RasPi | Raspberry Pi: A credit-card sized computer who's OS acts as a powerful combination to create smart robots |
| Docker | A software platform that allows you to build, test, and deploy applications quickly |
| FMS | Fleet management system: |
| VMap Ingress Module for FMS | Reads scanned LIDAR map file and converts it to FMS Python graph |
| Graph Module for FMS | Defines a storage format and provides functions for traversal |
| VDA5050 Module for FMS | To create VDA5050 JSON strings and read VDA5050 packets |
| MQTT Module for FMS | For communication between FMS and robots |
| Worker Module for FMS | with info about current location, state and speed it calculates the direction and speed to reach destination |
| Webserver Module for FMS | To recieve and execute requests from User Interface |
| Connection Module of Robot | Establishes MQTT connection with broker |
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| # | Theme | Goal | Feature Name | Est. Size (Feature) | Est. Size (Sprint) | Real Size (Feature) | Real Size (Sprint) | Burn-Down |
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| # | Feature Definition of Done | Sprint Release Definition of Done | Project Release Definition of Done |
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| | Linter & Checker were performed and passed | Everything of the sprint is merged into release candidate | User manual is written and passed review |
| | Code Review has been completed | Code builds without errors and tests successfull | Software documentation is written and passed review |
| | Code was merged in sprint release candidate | Acceptance of Product Owner for sprint release | Release candidate fulfills everything customer wants |
| | Updates are written in issue comments | Sprint release candidate is tagged as realse candidate | Code builds without errors and tests successfully |
| | Feature builds and tests successfully | Sprint release is tagged | Acceptance of Product Owner for release |
| | Acceptance by product owner | | Code in GitHub is documented and enough information is provided |
| | User Story & Acceptance Criteria fulfilled | | |
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| # | Theme | Goal | Feature Name | Est. Size (Feature) | Est. Size (Sprint) | Real Size (Feature) | Real Size (Sprint) | Burn-Down |
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| Type | Link / reference |
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| \ | Context | Name | Version | License | Comment |
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| 2x | Hardware | iClebo Kobuki Turtlebot | - | | http://kobuki.yujinrobot.com |
| 2x | Hardware | RaspberryPI | - | | |
| | Record and generate a map with the use of the turtlebots | SICK Map Engineering Tool | - | Protected | |
| | Turtlebot | SICK LiDAR Localization Software | - | Protected | https://github.com/SICKAG/sick_lidar_localization |
| | Turtlebot | ROS 2 (Robot Operating System) | galactic | | https://docs.ros.org/en/galactic/index.html |
| | Turtlebot | turtlebot2_ros2 | | | https://github.com/wn1980/turtlebot2_ros2 |
| | Fleet Management Software | Python | ? | | |
| | UI Terminal | JavaScript | ? | | |
| | UI Terminal | Vue.js | ? | MIT | |
| | UI Terminal | Bootstrap | ? | MIT | |
| | Deployment | Docker | ? | | |
| | Networking | OpenWRT | | | https://openwrt.org/ |
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| Last Name | First Name | Value | | | | | |
|---|---|---|---|---|---|---|---|
| #REF! | #REF! | | | | | | |
| Vogler | Tim | 8 | | **5.40** | **NOK** | | |
| Scherbel | Sebastian | 8 | | | | | |
| Blöcher | Meike | 5 | | | | | |
| Markert | Niklas | | | 0 | No size | | |
| Janjua | Muhammad Usman | 3 | | 1 | Trivial size | | |
| Moorthy | Venkatesh Kumar | 3 | | 2 | Small size | | |
| | | | | 3 | Medium size | | |
| | | | | 5 | Large size | | |
| | | | | 8 | Very large size | | |
| | | | | 13 | Too large (size) | | |