**DIPLOMA THESIS**

**Documentation**

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| Author(s) | Michael Reim, Clemens Pruggmayer, Mario Mottl |
| Form  Academic year | 5BHEL |
| Topic | Camera Controlled Swarm Robots |
| Co-operation Partners | - |

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| Assignment of Tasks | One or more autonomous vehicle (powered by an STM32F107RB + MDDS Board) should get detected by an camera that is attached 1,5 metres above the table. The positions of the vehicles should be converted into an x-y coordinate grid. The produced data should then be sent to our visualisation and simulation for correction purposes. A picture of a path should be drawn. The generated path should then be sent of to the Swarm Controll. Where the path will be transformed into vehicle commandos. |

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| Realisation | For proper detection an “DFK 33UX273” from ImagingSource was used. It’s connected via USB to an Laptop. The visualisation and simulation was programmed in “C++” + “OpenGl” which draws the cars onto the screen in Realtime. Swarm Controll uses an technology called “SvVis”. The vehicles run on an self-implemented RTOS-Software (Real Time Operating System) which transforms the vehicle commandos into engine movement. |

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| Results | An older version of the “SvVis” was used and altered to fit our purposes. An test track with a bracket for the camera was built. The tracking software was programmed in python. Vehicle Controll software was written with RTOS. The visualisation and simulation was programmed in “C++” + “OpenGl” for out specific purpose. |

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| Illustrative Graph, Photo  (incl. explanation) | The graph above pictures the whole System. There you can see the three main components. Tracking, Swarm Controll and Visualisation and Simulation. The communication between the individual blocks is realised in TCP. The communication between laptop and cars can be established in two ways WLAN, Bluetooth. |

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| Participation in Competitions  Awards | - |

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| Accessibility of  Diploma Thesis | HTL Hollabrunn  Anton Ehrenfriedstraße 10  2020 Hollabrunn |

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| Approval  (Date / Sign) | Examiner | Head of College / Department |