Shyngyskhan Abilkassov

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Education

- **Nazarbayev University** — Astana, Kazakhstan
  BSc in Robotics and Mechatronics; GPA: 3.79, Top 5% — *August 2017 - May 2021*

Publications

- Abilkassov, S., Nurlybayev, A., ... & Shintemirov, A. (2020). **Facilitating Autonomous Vehicle Research and Development Using Robot Simulators on the Example of a KAMAZ NEO Truck**, The 23rd IEEE International Conference on Intelligent Transportation Systems, (ITSC), September 20-23, 2020.

Experience

- **ALARIS Laboratory** — Astana, Kazakhstan
  Research Assistant — *December 2018 - Present*
  - Led the integration and testing team of **autonomous truck model** in Webots simulator using ROS middleware.
  - Created simulation environment and truck model in Webots and integrated messaging for *LiDAR, Camera, IMU, GPS* sensors for remote data acquisition and control of simulation truck model
  - Implemented topic data subscription and publishment for non-ROS environment through sockets and Flask REST service for data exchange with web interfaces
  - Implemented data communication using WebSockets for **remote goal dispatch, state** and **path monitoring** on dashboard
- **Google Summer of Code, JdeRobot** — Remote
  Open Source developer — *May 2019 - August 2019*
  - Developed **indoors localization, goal navigation, item pick-and-place logic,** and **resting behaviour** for full scale autonomous task completion for warehouse robot in Gazebo
  - Improved local navigation task performance for robot in complex interior environment. Robot reaches desired destination **2 times faster** than previous implementation
  - Integrated proper transformations for sensor frames, introduced proper ROS topics messaging and naming, and integrated *SLAM, AMCL, Navigation stack* ROS packages into the Gazebo simulation
- **Zerde National Infocommunication Holding** — Astana, Kazakhstan
  Full Stack Developer - Intern — *April 2018 - July 2018*
  - Developed user-interface for search and export of documents using Elastic Search in MongoDB database.
  - Implemented user activity monitoring web service in internal portal, and designed and created both **REST service and admin interface** using *AngularJS and Java Spring.*

Projects

- **Driver Drowsiness Estimation** Open-source implementations of multiple papers on driver drowsiness estimation based on eye **region extraction, segmentation, and morphological analysis** for estimation of driver drowsiness
- **Distracted Driver Posture Classification** A multi-modal m-CNN for distracted driver posture classification based on two **ResNet50** models trained on self-gathered dataset using transfer learning with a classification accuracy 90%
- **IMU Head Tracker interface** Fused data from accelerometer and magnetometer sensors on STM32F3 Discovery module through I2C communication and calibrated it for application control using head position.

Programming Skills

- **Languages**: Python, C, C++, Java, MATLAB, Javascript, NoSQL, HTML, CSS/SASS
- **Technologies and Frameworks**: ROS, Gazebo, OMPL, PyTorch, scikit-learn, OpenCV, Git

Accomplishments

- **1st place** - HackNU International Hackathon, 2018 and 2019.
- **2nd place** - Astana Innovations Challenge, Smart Services, 2018.
- **Fellow recipient** - Bertelsmann Data Science Scholarship.