Power and Energy Consumption Analysis of the Mobile Robot TOMM

Background
In robot systems, and especially in autonomous mobile robot systems, power limits and energy consumption are critical factors which influence the stability, agility and mobility of the robot. The weight and the size of energy storages and cable diameters are limited while the consumers (e.g. motors, skin) are distributed over the whole robot.

Tasks
To understand and improve robot performance and stability in general an in-depth power and energy consumption analysis is needed. This includes:

T1: Structural Analysis of TOMM's Power Network (suppliers and consumers)
T2: Power Analysis (Mean Power, Peak Power, Detection of potential Instabilities)
T3: Energy Analysis (Short and Long Time Energy Profile, Estimation of TOMM's Operation Time)
T4: Investigation and definition of a "mission profile" of battery power
T5: Discussion with well-grounded suggestions to improve TOMM's power system and the power systems of mobile robots in general

Requirements
- Well-funded knowledge in electrical power circuits
- Experience in measuring electrical parameters
- The ability to work independently
- Good English skills, both written and spoken

Ausrichtung
☐ Zellcharakterisierung
☒ Messreihenstudie
☐ Hardwareentwicklung
☐ Softwaredesign
☐ Modellierung
☐ Simulation
☒ Literaturrecherche

Studiengang
☒ Elektro-/Informationstechnik
☐ Informatik
☐ Maschinenbau
☐ Physik
☐ Mathematik
☐ Chemieingenieurwesen
☐ Wirtschaftsingenieurwesen

Startdatum
ab 01.01.2017

Ansprechpartner
Markus Hofmann (EES)
m.hofmann@tum.de
Florian Bergner (ICS)
florian.bergner@tum.de