8. Kokkuvõte

Bakalaureusetöö eesmärgiks oli projekteerida elektriline mootorratas, mis kasutab elektrimootorina omapärast aksiaalvoo mootorit. Töö esimese etapi käigus vaadeldi juba turul olevate tootjate mudeleid ning nende võimekusi. Kontseptsioonide seas kaaluti mootori paigutamist kas raami või ratta sisse. Arvestades keskkonda, kus masin on mõeldud kasutamiseks, otsustati mootor paigutada raami sisse, et tagada kindel ja turvaline asukoht ning kaitse väliskeskkonna eest.

Suur osa tööst keskendus koostude ja kere projekteerimisele, millega paralleelselt viidi läbi tugevusarvutusi. Lõpliku raami tugevus osutus rahuldavaks.

Võrreldes lõplikku mootorratast turul olevate konkurentidega, selgus, et võimsuse ja kaalu poolest suuri erinevusi ei esine. Suurim erinevus ilmnes aku mahtuvuses, mis konkurentidel on märgatavalt suurem. See on mõistetav, sest enamus konkurentidel on oma aku konfiguratsioonid välja arendatud. Projekti raames akupaki mahtuvuse suurendamiseks oleks vaja investeerida nii ajalist kui ka rahalist ressurssi, et arendada võimekam aku.

Projekteeritud mootorratas on 18 kW-ne 71 kg kaaluv elektriline masin. Aksiaalne mootor suudab tagarattale tekitada kuni 425 Nm väänet, mis võimaldab ka kõige raskema läbitavusega maapinda ületada. Aku mahtuvus on 2 kWh, mis on piisavalt, et rahulikult looduses ringi sõita. Väiksema aku eelis on kiire laadimisaeg - antud akupakk laeb ennast täielikult täis umbes kahe tunniga. Projekti koostamise hinnaks kujunes ligikaudu 6200 €.

Summary

The aim of the bachelor's thesis was to design an electric motorcycle that uses a unique axial flow motor as its electric motor. During the first stage of the project, existing models from manufacturers on the market were examined, along with their capabilities. Among the concepts considered was whether to place the motor inside the frame or the wheel. Considering the environment where the machine is intended for use, it was decided to place the motor inside the frame to ensure a secure and protected location, shielded from external elements.

A significant part of the work focused on designing assemblies and the body, while concurrently conducting strength calculations. The final frame's strength proved satisfactory. When compared to competing motorcycles on the market, there were no significant differences in terms of power. The most noticeable difference was in battery capacity, which competitors had significantly larger. This is understandable, as most competitors have developed their own battery configurations. To increase the capacity of the designed battery pack within the project, both time and financial resources would be needed to develop a more powerful battery.

The designed motorcycle is an 18 kW, 71 kg electric machine. The axial motor can generate up to 425 Nm of torque to the rear wheel, allowing it to overcome even the most challenging terrains. The battery capacity is 2 kWh, sufficient for leisurely rides in nature. The advantage of the smaller battery is its fast-charging time—this battery pack can fully charge in approximately two hours. The estimated cost of the project was around €6200.