KOKKUVÕTE

Selle töö eesmärk on projekteerida portatiivne FDM tüüpi 3D-printer, mille protsessi töö kirjeldab. Võtsin aluseks eelmudeli, mille enne lõputöö sooritamist teinud olin, ja mida kasutasin tootearendusprotsessi baasina, mida selle töö käigus edasi arendasin.

Loetlen järgnevalt tööprotsessid:

- Hindamismaatriksite abil leidsin antud kontseptsiooniks sobivaima lahenduse;
- Valitud kinemaatika uurimiseks ehitasin mudeli, millega selgitada tehnilise lahenduse eripärasid;
- Mehhaanika ja elektroonika komponentide valik;
- Inseneritehnilised arvutused, et valida piisava momendiga samm-mootorid ja kontrollida nende sobivust CoreXZ kinemaatikga printeri X-telje vajumisel toitevoolu katkestusel;
- Projekteerimine sobivate tehniliste lahenduste leidmiseks.

Tööetappe tuli lõpliku tulemuse saavutamiseks läbida korduvalt. Töö põhirõhk muutus protsessi jooksul projekteerimisest kinemaatika arvutusteks.
Antud töös läbi viidud arvutusi saab tulevikuski kasutada sarnaste probleemide lahendamiseks. Kuna kasutatud lahenduskäik on varememalt dokumenteerimata, siis on sellest kasu kõigile neile, kel sellise lahenduskäigu vastu huvi ja vajadus on. Printeri projekteerimine polnud lõplik ega nii detailne, kui selle töö mahtuvus oleks lubanud, seega saab selle mudeliga jätkata ka arendustööd magistrantuuris.

ABSTRACT

The purpose of this thesis is to describe the process of engineering of a portative FDM type 3D printer. For the basis of this process was a precedent model that I had built before writing this thesis, as it was useful to use as a production development sample that I continued to develop during the engineering practice for this thesis.

- The construction of my project follows these steps:
- Using the evaluation matrixes helped me to find the right solution for the concept;
- I built a model to investigate the kinematics that would help me to understand the; technical specifics of the solution
- The choice of mechanical and electrical components;
- The calculating of engineering technics to choose suitable stepper motors and to test their adaptability to CoreXZ kinematic printer's X-axis subsidence in the condition of interrupted supply current;
- The engineering of suitable technical solutions.

The phases of the work had to be carried out repeatedly in order to achieve the end result. The emphasis of this thesis moved from engineering to calculations of kinematics. All the calculations made in this thesis are suitable for the usage for similar problems. As this sort of solution pattern has not been documented before, it can be useful for anybody who has a need or interest for it. The engineering of the 3D printer has not been finished nor is it as detailed as this thesis would permit, so further developments can be continued in masters program.