**EASY WHEELCHAIR**

Prepared by: Pun Jen Nian

# ABSTRACT

This report contains aims and purposes for the project. A human-powered mechanism should be designed which can be attached to any wheelchair and with a major function that allows user to travel up an inclined plane with lesser effort on their arm. Concept generation, AutoCAD drawing, calculation, analysis, researches were all included into this report. To ensure the project to follow up the time, Gantt chart was prepared so that all the steps were planned since the start of the project to prevent any conflicts and clashes.

Various of concepts were generated and evaluated in order to came out the best solution as all the concepts contains advantages and disadvantages. All the advantages were merged together to create a final design that similar to bicycle mechanism which is using sprocket and roller chain. Detail drawing was drawn using AutoCAD with actual dimension. Analysis on sprocket ratio and material were carried out to ensure the mechanism can perform with high efficiency.

Additional functions were included to the mechanism to improve the system. Locking device was merged to the mechanism as it is dangerous if user release their hand while travelling up a slope. Locking device will lock the wheel so that the wheelchair won't fall back which might harm the user. Gear shifter was added into the mechanism as well so that user can shift the gear according to different condition.

Safety features were clearly stated in the report which are adding a cover to the mechanism and maintenance should be done frequently. Lubrication on the system is necessary to prevent corrosion and friction.

Chain tensioner is needed to keep the chain in tense and the mechanism should be modified so that it is flexible to its position. Retractable handle should replace the previous handle to decrease the width of the overall wheelchair.

In conclusion, this mechanism has been designed and proven in theory by using all the knowledge the student gained from the past 4 years of engineering.