

CHAPTER 5

CLOSING

5.1 Conclusion

Based on the kinematic analysis and dimensional synthesis that has been carried out on the planar six-bar crank-driven leg mechanism, it can be concluded that a combination of kinematic constants has been obtained as the dimensions of the mechanism to obtain a step pattern that is close to the human leg trajectory with an error of 2.14×10^{-25} mm at seven main precision points. The combination of kinematic constants consists of $r_1 = 341.79$ mm, $r_2 = 78.26$ mm, $r_3 = 178.32$ mm, $r_4 = r_7 = 258.61$ mm, $r_5 = r_6 = 452.72$ mm, $\beta = 145.90^\circ$ and $\gamma = 54.67^\circ$. These kinematic constants can serve as design parameters for developing a planar six-bar crank-driven leg mechanism capable of generating a human-like walking trajectory.

5.2 Suggestion

Based on the results of this final project, future research is recommended to manufacture and experimentally validate the synthesized mechanism. Prototype testing can be conducted to evaluate whether the actual walking trajectory agrees with the analytical and CAD simulation results, while also considering practical factors such as manufacturing tolerances, joint clearances, friction, and structural deformation.

