

# Application of Particle Swarm Optimization for Mechanical Component Design

Sumanut Suriyanoi<sup>1,a</sup>, and Warisa Wisittipanich<sup>1,b,\*</sup>

<sup>1</sup> Department of Industrial Engineering, Faculty of Engineering, Chiang Mai University, Chiang Mai, 50200, Thailand

**E-mail:** <sup>a</sup>sumanut\_s@hotmail.com, <sup>b,\*</sup>warisa.o@gmail.com (Corresponding author)

**Abstract.** Mechanical Components are the foundation of machines and work producing devices. In general, the design problems are very complex and nonlinear due to its constraints and a numerous number of decision variables. The Particle Swam Optimization (PSO) algorithm is a computational technique that optimizes a problem by iteratively trying to improve a candidate solution with regard to a given measure of quality. In this paper, the PSO algorithm is used to solve three well-known mechanical engineering component design problems and to compare the results with the previous works. It shows that the PSO algorithm provides better solutions than other algorithms. However, there are many different types of PSO and techniques in finding optimal parameters as well as the encoding and decoding methods which are worth for further improvements in the future.

**Keywords:** Mechanical Components, Engineering Design, Particle Swarm Optimization.