

**SIMULTANEOUS OPTIMIZATION OF STRUCTURE  
AND CONTROL FOR TIME-OPTIMAL MOTION  
OF VIBRATORY MECHANICAL SYSTEMS**

**BOONRUK SUCHAITANAWANIT**

**DOCTOR OF PHILOSOPHY  
IN MECHANICAL ENGINEERING**

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**GRADUATE SCHOOL  
CHIANG MAI UNIVERSITY  
MAY 2016**

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The seal of Chiang Mai University is a circular emblem. It features a central figure of an elephant standing and facing left. Above the elephant's head is a five-pointed star with a flame-like center. The Thai text "มหาวิทยาลัยเชียงใหม่" (Mahavithayalai Chiang Mai) is written in a circular path around the top of the seal. The English text "CHIANG MAI UNIVERSITY 1964" is written around the bottom. There are decorative floral motifs on the left and right sides of the seal.

**BOONRUK SUCHAITANAWANIT**

**A THESIS SUBMITTED TO CHIANG MAI UNIVERSITY IN PARTIAL  
FULFILLMENT OF THE REQUIREMENTS FOR THE DEGREE OF  
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Boonruk Suchaitanawanit

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