## STRONG CONVERGENCE OF MODIFIED HALPERN ITERATIONS IN CAT(0) SPACES

ASAWATHEP CUNTAVEPANIT

DOCTOR OF PHILOSOPHY
IN MATHEMATICS

Adams university

Copyright by Chiang Mai University

All righters GRADUATE SCHOOL

CHIANG MAI UNIVERSITY

CHIANG MAI UNIVERSITY
APRIL 2013

## STRONG CONVERGENCE OF MODIFIED HALPERN ITERATIONS IN CAT(0) SPACES

ASAWATHEP CUNTAVEPANIT

A THESIS SUBMITTED TO THE GRADUATE SCHOOL IN PARTIAL FULFILLMENT OF THE REQUIREMENTS

FOR THE DEGREE OF

DOCTOR OF PHILOSOPHY

IN MATHEMATICS

Adams un on one of the graduate school erve of the graduat

CHIANG MAI UNIVERSITY
APRIL 2013

### STRONG CONVERGENCE OF MODIFIED HALPERN ITERATIONS IN CAT(0) SPACES

ASAWATHEP CUNTAVEPANIT

THIS THESIS HAS BEEN APPROVED
TO BE A PARTIAL FULFILLMENT OF THE REQUIREMENTS
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY
IN MATHEMATICS

THESIS ADVISORY COMMITTEE

**EXAMINING COMMITTEE** 

Asst. Prof. Dr. Poom Kumam

Asst. Prof. Dr. Poom Kumam

Asst. Prof. Dr. Bancha Panyanak

Asst. Prof. Dr. Sompong Dhompongsa

Bounda MEMBER
Prof. Dr. Suthep Suantai

Bounda Dule MEMBER
Asst. Prof. Dr. Bancha Panyanak

P. Cholamjiak MEMBER
Lect. Dr. Prasit Cholamjiak

29 APRIL 2013

© Copyright by Chiang Mai University

#### **ACKNOWLEDGEMENTS**

Contribution and support from many people helped me completion of this thesis, I would like to take this opportunity to express my appreciation to them.

First, I would like to express my deepest thank to my supervisor, Asst. Prof. Dr. Bancha Panyanak, for his initial idea, guidance and encouragement which enable me to carry out my study successfully.

This work contains a number of improvement based on comments and suggestions provided by Asst. Prof. Dr. Bancha Panyanak, Prof. Dr. Sompong Dhompongsa and Prof. Dr. Suthep Suantai. It is my pleasure to express my sincere thanks to them for their generous assistance.

I would like to express my deep gratitude to my beloved family for their love and encouragement throughout my graduate study.

Moreover, I would like to thank all of my teachers for my knowledges, skills and their previous valuable instructions while studying.

Finally, I greatly appreciate the Centre of Excellence in Mathematics the Commission on Higher Education, Thailand for financial support.

Asawathep Cuntavepanit

# ลิขสิทธิ์มหาวิทยาลัยเชียงใหม Copyright<sup>©</sup> by Chiang Mai University All rights reserved