



SOUTH EAST ASIAN MATHEMATICAL SOCIETY

FINAL REPORT

Fixed Point Theory and Optimization

Chiang Mai University, Chiang Mai, Thailand
24 – 31 July 2017

Organized by

Chiang Mai University, Chiang Mai, Thailand

With the support of
CIMPA, Thailand Research Fund and Chiang Mai University

<2017>

“Fixed Point Theory and Optimization”

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I. Summary

Fixed point theory plays very important role in nonlinear analysis and applications. Most of important nonlinear problems in science and applied science reduce to solving a given equation or inequality which in turn may be reduced to finding the fixed points of a certain operator and fixed point theory plays an important role for solving solutions of those problems. There are mainly two important questions arising for solving those problems. The first one is the existence of solutions of those problems, and the second one is that how can we find or approximate those solutions of such problems. Many mathematicians are interested in studying and investigating those two problems. They can discover many new theorems which are very useful for solving many problems in science and applied science and economics.

There are many problems in economics, finance, transportation, network and structural analysis, elasticity, and optimization which can be solved by using equilibrium theory. The equilibrium problems cover many important problems such as minimization problems, variational inequality problems. In 199, Combettes and Hirstoaga first studied and constructed an iterative method for finding a solution of the equilibrium problem in a Hilbert space. They proved strong convergence theorem of their iterative method under some sufficient conditions. Their main results can be applied for solving variational inequality problem and they showed that there is a close relation between the fixed point problem and the equilibrium problem. So, many techniques in fixed point theory can be applied for the equilibrium problems. Many problems in science and applies science, physics, economics and others areas are more complicated. The solutions of those problems concern intersection of fixed point problems, variational inequality and equilibrium problems. So, the problem of finding a common solutions of those problems are very useful for applications and widely studied by many mathematicians.

Motivated by many previous works concerning the equilibrium problems, fixed point problems and other important problems in science, applied science and economics, our school are interested to provide a fundamental and useful basic concepts in fixed point theory and optimization theory for young researchers from each country member of SEAMS.

II. Scientific Objectives and Rationale for the School

1. To provide fundamental and basic knowledge in Fixed Point Theory and Optimization Theory for young researchers from each country member of SEAMS.
2. To discuss research directions in Fixed Point Theory and Optimization Theory among young researchers and expert professors in this area.
3. To build and develop young researchers and research network in the area of Fixed Point Theory and Optimization

III. Organizers and Lecturers

Organizers

1. Name	:	Prof. Dr. Suthep Suantai
Institution	:	Chiang Mai University, Chiang Mai, Thailand
Email and Phone	:	suthep.s@cmu.ac.th
2. Name	:	Asist. Dr. Bancha Banyanak
Institution	:	Chiang Mai University, Chiang Mai, Thailand
Email and Phone	:	bpanyanak@yahoo.com

Lecturers

<p>1. Prof. Dr. Yeol-Je Cho, Department of Mathematics Education, Gyeongsang National University, Jinju, 66 660-701, Korea. Email : yjcho@gnu.ac.kr, yjchomath@gmail.com, male.</p> <p>2. PROF. PHAN QUOC KHANH, INTERNATIONAL UNIVERSITY, VIETNAM NATIONAL UNIVERSITY HOCHIMINH CITY, VIETNAM. male .</p> <p>3. Prof. Dr. Suthep Suantai, Department of Mathematics, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand 50200, Email: suthep.s@cmu.ac.th, male</p> <p>4. Assoc. Prof. Dr. Narin Petrot, Naresuan University, Phitsanulok, Thailand. Email : narinp@nu.ac.th, male</p> <p>5. Assist. Prof. Dr. Bancha Panyanak, Department of Mathematics, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand 50200, Email: bpanyanak@yahoo.com , male .</p> <p>6. Assoc.Prof. Dr. Chulin Likasiri, Department of Mathematics, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand 50200, Email: w_inthakon@hotmail.com , female .</p> <p>7. Asist. Prof. Thanasak Muaktonglang, Department of Mathematics, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand 50200, Email: bpanyanak@yahoo.com , male .</p> <p>6. Assist. Prof. Dr. Warunun Inthakon, Department of Mathematics, Faculty of Science, Chiang Mai University, Chiang Mai, Thailand 50200, Email: w_inthakon@hotmail.com , female .</p>

IV. The Participants

Our school contains 46 participants as the following list :

NO.	FIRST (MIDDLE) FAMILY NAME	GENDER	INSTITUTION	COUNTRY
1	SAW WIN	M	YADANABON UNIVERSITY	MYANMAR
2	PHAUK SOKKHEY	M	INSTITUTE OF TECHNOLOGY OF CAMBODIA	CAMBODIA
3	CHRISTIAN ALVIN H. BUHAT	M	UNIVERSITY OF THE PHILIPPINES LOS BAÑOS	PHILIPPINES
4	ANH-TUAN NGUYEN	M	VIETNAM INSTITUTE FOR ADVANCED STUDY IN MATHEMATICS	VIETNAM
5	TIARA JAILANI	F	ANDALAS UNIVERSITY	INDONESIA
6	CHUNG YAO LIANG	M	UNIVERSITI SAINS MALAYSIA	MALAYSIA
7	DIANITA PUTRI ARMY	F	INSTITUT TEKNOLOGI BANDUNG	INDONESIA
8	NISA FADLILAN FATHUL ILMI	F	INSTITUT TEKNOLOGI BANDUNG	INDONESIA
9	DITA PRAMESTI	F	BANDUNG INSTITUTE OF TECHNOLOGY	INDONESIA
10	RAHMAWATI RAMADHAN	F	ANDALAS UNIVERSITY	INDONESIA
11	LITA WULANDARI AELI	F	ANDALAS UNIVERSITY	INDONESIA
12	ZUHAIRINA RAMADHANINGRUM	F	INSTITUT TEKNOLOGI BANDUNG	INDONESIA
13	NELA RIZKA	F	BANDUNG INSTITUTE OF TECHNOLOGY	INDONESIA
14	FINTI WARNI		ANDALAS UNIVERSITY	INDONESIA
15	JOHN SEBASTIAN H. SIMON	M	UNIVERSITY OF THE PHILIPPINES BAGUIO	PHILIPPINES
16	DESTINY S. LUTERO	F	UNIVERSITY OF THE PHILIPPINES LOS BAÑOS	PHILIPPINES
17	AUNG ZAW MYINT	M	SHWEBO UNIVERSITY	MYANMAR
18	RAWEEROTE SUPARATULATORN	M	CHIANG MAI UNIVERSITY	THAILAND

19	SATABAN SRISURIYATADA	M	CHIANG MAI UNIVERSITY	THAILAND
20	PORAMIN BOONPAN	M	CHIANG MAI UNIVERSITY	THAILAND
21	VARAYUT BOONYASRI	M	CHIANG MAI UNIVERSITY	THAILAND
22	PAYAKORN SAKSURIYA	M	CHIANG MAI UNIVERSITY	THAILAND
23	ADSADANG HIMAKALASA	M	CHIANG MAI UNIVERSITY	THAILAND
24	BEN WONGSAIJAI	M	CHIANG MAI UNIVERSITY	THAILAND
25	LIMPAPAT BUSSABAN	M	CHIANG MAI UNIVERSITY	THAILAND
26	KANRUETHAI JEENKAEW	F	CHIANG MAI UNIVERSITY	THAILAND
27	PANITARN SARNMETA	M	CHIANG MAI UNIVERSITY	THAILAND
28	ADISAK HANJING	M	CHIANG MAI UNIVERSITY	THAILAND
29	CHALONGCHAI KLANARONG	M	CHIANG MAI UNIVERSITY	THAILAND
30	PHIKUL SRIDARAT	F	CHIANG MAI UNIVERSITY	THAILAND
31	PACHARA JAILOKA	M	CHIANG MAI UNIVERSITY	THAILAND
32	NUTTAWUT BUNLUE	M	CHIANG MAI UNIVERSITY	THAILAND
33	PANAS KALAYANAMIT	M	CHIANG MAI UNIVERSITY	THAILAND
34	DAWAN CHUMPUNGAM	F	CHIANG MAI UNIVERSITY	THAILAND
35	JUKRAPONG TIAMMEE	M	CHIANG MAI RAJABHAT UNIVERSITY	THAILAND
36	SAKAN TERMKEW	M	SRINAKHARINWIROT UNIVERSITY	THAILAND
37	THATPONG ANAN	M	SRINAKHARINWIROT UNIVERSITY	THAILAND
38	KUNRADA KANKAM	F	UNIVERSITY OF PHAYAO	THAILAND
39	PITTAYA SRINAK	M	UNIVERSITY OF PHAYAO	THAILAND
40	ANIRUTH PHON-ON	M	PRINCE OF SONGKLA UNIVERSITY, PATTANI CAMPUS	THAILAND
41	AREEYUTH SAMA-AE	M	PRINCE OF SONGKLA UNIVERSITY, PATTANI CAMPUS	THAILAND
42	PHAKDI CHAROENSAWAN	M	CHIANG MAI UNIVERSITY	THAILAND
43	ORAWAN TRIPAK	F	PRINCE OF SONGKLA UNIVERSITY	THAILAND
44	SUPANUT CHAIDEE	M	CHIANG MAI UNIVERSITY	THAILAND

45	ATIT WIRIYAPONGSANON	M	CHIANG MAI UNIVERSITY	THAILAND
46	THODSAPORN KUMDUANG	M	CHIANG MAI UNIVERSITY	THAILAND

V. School Programs

DATE	TIME	TOPIC/ACTIVITY	LECTURERS
24 JULY 2017	8.30 – 9.00	REGISTRATION AND OPENING CEREMONY	
	9.00 – 10.30	BASIC BACKGROUND IN FUNCTIONAL ANALYSIS	PROF. DR. SUTHEP SUANTAI
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	FIXED POINT THEORY IN METRIC SPACES (I)	PROF. DR. SUTHEP SUANTAI
	12.00 – 13.00	LUNCH	
	13.00 – 14.30	LECTURE I : BANACH FIXED POINT THEOREM	PROF. DR. YEOL-JE CHO
	14.30 – 14.50	COFFEE BREAK	
	14.50 – 16.30	FIXED POINT THEORY IN METRIC SPACES (II)	PROF. DR. SUTHEP SUANTAI
	16.30 – 17.00	DISCUSSION	
25 JULY 2017	9.00 – 10.30	FIXED POINT THEORY IN HILBERT AND BANACH SPACES (I)	ASSOC. PROF. DR. BANCHA PUNYANAK
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	FIXED POINT THEORY IN HILBERT AND BANACH SPACES (II)	ASSOC. PROF. DR. BANCHA PUNYANAK
	12.00 – 13.00	LUNCH	

	13.00 – 14.30	LECTURE II : BANACH FIXED POINT THEOREM	PROF. DR. YEOL- JE CHO
	14.30 – 14.50	COFFEE BREAK	
	14.50 – 16.30	FIXED POINT THEORY IN HILBERT AND BANACH SPACES (III)	ASSOC. PROF. DR. BANCHA PUNYANAK
	16.30 – 17.00	DISCUSSION	
26 JULY 2017	9.00 – 10.30	SOME FIXED POINT ITERATION METHODS	PROF. DR. SUTHEP SUANTAI
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	SOME APPLICATIONS OF FIXED POINT THEORY	PROF. DR. SUTHEP SUANTAI
	12.00 – 13.00	LUNCH	
	13.00 – 14.30	LECTURE III : BANACH FIXED POINT THEOREM	PROF. DR. YEOL- JE CHO
	14.30 – 14.50	COFFEE BREAK	
	14.50 – 16.00	SOME RECENT RESULTS IN FIXED POINT THEORY	ASST. PROF. DR. WARUNAN INTHAKON
	16.00 – 17.00	DISCUSSION	
27 JULY 2017	9.00 – 10.30	SOME RESEARCH PROBLEMS IN FIXED POINT THEORY	ASSOC. PROF. DR. BANCHA PUNYANAK
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	RATE OF CONVERGENCE OF SOME ITERATIVE METHODS FOR FIXED POINT PROBLEMS	PROF. DR. SUTHEP SUANTAI
	12.00 – 13.00	LUNCH	

	13.00 – 17.00	EXCURSION	
28 JULY 2017	9.00 – 10.30	UNCONSTRAINED OPTIMIZATION (I)	ASSOC. PROF. DR. NARIN PETROT
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	UNCONSTRAINED OPTIMIZATION (II)	ASSOC. PROF. DR. NARIN PETROT
	12.00 – 13.00	LUNCH	
	13.00 – 14.30	NONLINEAR CONSTRAINED OPTIMIZATION (I)	PROF. DR. PHAN QUOC KHANH
	14.30 – 14.50	COFFEE BREAK	
	14.50 – 16.30	UNCONSTRAINED OPTIMIZATION (III)	ASSOC. PROF. DR. NARIN PETROT
	16.30 – 17.00	DISCUSSION	
29 JULY 2017	9.00 – 10.30	NONLINEAR CONSTRAINED OPTIMIZATION (II)	PROF. DR. PHAN QUOC KHANH
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	NONLINEAR CONSTRAINED OPTIMIZATION (III)	PROF. DR. PHAN QUOC KHANH
	12.00 – 13.00	LUNCH	
	13.00 – 14.30	UNCONSTRAINED OPTIMIZATION (IV)	ASSOC. PROF. DR. NARIN PETROT
	14.30 – 14.50	COFFEE BREAK	
	14.50 – 16.30	UNCONSTRAINED OPTIMIZATION (V)	ASSOC. PROF. DR. NARIN PETROT
	16.30 – 17.00	DISCUSSION	
	18.00 - 21.30	BANQUET	FUNRUK RESORT SANPATONG, CHIANG MAI

30 JULY 2017	9.00 – 10.30	COMBINATORIAL OPTIMIZATION (I)	ASSOC. PROF. DR. CHULIN LIKASIRI
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	COMBINATORIAL OPTIMIZATION (II)	ASSOC. PROF. DR. CHULIN LIKASIRI
	12.00 – 13.00	LUNCH	
	13.00 – 14.30	RESEARCH DIRECTION IN OPTIMIZATION	PROF. DR. PHAN QUOC KHANH
	14.30 – 14.50	COFFEE BREAK	
	14.50 – 16.30	RESEARCH IN CONTINUOUS OPTIMIZATION	ASST. PROF. DR. THANASAK MOUKTONGLANG
	16.30 – 17.00	DISCUSSION	
31 JULY 2017	9.00 – 10.30	RESEARCH IN OPTIMIZATION PROBLEMS	ASSOC. PROF. DR. NARIN PETROT
	10.30 – 10.50	COFFEE BREAK	
	10.50 – 12.00	DISCUSSION AND CLOSING CEREMONY	

VI. Conclusion

Our school has provided a fundamental and useful basic concepts in fixed point theory and optimization theory for 46 young researchers from 7 countries of SEAMS ; Cambodia, Indonesia, Malaysia, Myanmar, Philippines, Vietnam, and Thailand. Our participants are very interested to learn these two new topics. They have very good opportunities to study and discuss some assigned works by doing together their group exercises. Moreover, many research directions related to both topics are also discussed. Our school has provided participants not only academic activities but they also get very good experience for making other exchange , such as culture exchange and friendship among them. We hope that all of them got enough basic knowledge and directions for doing their research works in the future.

VII. Financial Report

No	ITEM	DETAILS	SOURCES	
			CIMPA (THAI BAHT)	THAILAND RESEARCH FUND AND CHIANG MAI UNIVERSITY (THAI BAHT)
1	TICKETS			
	OVERSEAS PARTICIPANTS	1. SAW WIN 7,075 BAHT 2. PHAUK SOKKHEY 9,265 BATH 3. CHRISTIAN ALVIN H. BUHAT 10,429 BAHT 4. ANH-TUAN NGUYEN 14,836 BAHT 5. TIARA JAILANI 8,339 BAHT 6. CHUNG YAO LIANG 7,182 BAHT TOTAL = 57,126 BAHT	57,126	-

	SPEAKERS (OVERSEAS AND LOCAL)	1. PROF. YEOL JE CHO 24,690.12 BAHT 2. PROF. PHAN QUOV KHANH 19,497 BAHT 3. ASSOC. PROF. DR. NARIN PETROT 2,800 BAHT	22,297	24,690.12
2	ACCOMMODATION			
	PARTICIPANTS	HOTEL FOR 17 PARTICIPANTS FROM SEAMS COUNTRIES (SEE DETAILS IN THE ATTACHED FILE)	52,000	
	SPEAKERS	HOTEL FOR 3 SPEAKERS 1. PROF. YEOL JE CHO 16,000 BAHT 2. PROF. PHAN QUOC KHANH 8,000 BAHT 3. ASSOC. PROF. DR. NARIN PETROT 3,700 BAHT	11,700	16,000
3	FOOD EXPENSES	1. LUNCH AND COFFEE BREAK FOR 17 OVERSEA PARTICIPANTS AND 2 SPEAKERS FROM ABOARD = 1,080 X 19 = 20,520 BAHT 2. HALAL FOOD FOR 10 PARTICIPANTS FROM ABOARD 800 BAHT/EACH = 8,000 BAHT 3. LUNCH AND COFFEE BREAK FOR THAI PARTICIPANTS AND THAI SPEAKERS AND ORGANIZERS 45 PERSONS = 1,080 X 45 = 48,600 BAHT	20,520 8,000	48,600
4	LOCAL TRANSPORT	TRAVELLING : HOTEL - CHIANG MAI UNIVERSITY 8 DAYS (24 – 31 JULY 2017)		4,800
5	SUPPLIES AND PRINTINGS			9,500
6	LIVING EXPENSES	SPEAKERS : 1. PROF. YEOL JE CHO 8,000 BAHT 2. PROF. PHAN QUOV KHANH 8,000 BAHT 3. ASSOC. PROF. DR. NARIN PETROT 6,000 BAHT	22,000	
7	SOCIAL PROGRAM (EXCURSION AND BANQUET)	TRANSPORTATION 4,800 BAHT TICKETS FOR ENTRANCE TO PHUPING KING PALACE BANQUET 6,000 BAHT	6,000	4,800 1,120
	TOTAL	IN THAI BAHT	199,643	109,510.12
	TOTAL	IN EURO	5,074.28 EUR	2,783.39 EUR

NOTE : USE THE RATE OF EXCHANGE ON 21 JULY 2017 FROM BANK OF THAILAND IS THE
FOLLOWING : 1 EUR = 39.3441 BAHT