AEARU Science & Engineering Summer Camp 参加者募集

北京大学(中国)にて開催される「AEARU Science & Engineering Summer Camp」の案内が届きましたので、下記の通り、学内募集を行います。選考通過者には、渡航費等の費用の一部を本学が支援します。

1. 概要　電気工学およびコンピューター科学　の最先端分野に焦点をあてた9つのコースが提供され、参加者は、最大2コースを選択できます。カーネギーメロン大学、オックスフォード大学、インペリアル・カレッジ・ロンドン、エディンバラ大学等から招聘された教授が講義を行います。参加にあたっては、数学、アルゴリズム、物理学、工学についての基礎知識が必要とされます。プログラムの詳細は、2ページ以降をご参照ください。

※AEARUとは・・・The Association of East Asian Research Universities(東アジア研究型大学協会)の略称です。1996年に、東アジアの大学間のパートナーシップ強化の為に設立されたコンソーシアムで、現在、中国、台湾、韓国、日本から合計18大学がこのコンソーシアムに参加しています。

2. 開催時期　2017 年 7 月 3 日(月)～8 月 4 日(金)（留学期間は選択コースによって異なります）

3. 開催地　北京大学(北京、中国)

4. 応募資格　本学所属の学部生、大学院生

5. 推薦人数　2 名

6. 参加費　学費(10,000 人民元) は免除。宿舎費(大学内の場合、1 泊 150 人民元)、食費、渡航費、現地交通費、保険費用、その他費用については自己負担。成績優秀者には、AEARUより宿舎費の補助（宿泊日数 15 日を上限)があります。学内選考に合格した場合、渡航費等の費用の一部を本学が支援します。ただし、外国人留学生は私費の正規課程在籍者が支援の対象となります。

7. 提出書類　※書類不備の場合は受け付けないので、注意すること。
①海外派遣プログラム願書(様式1)＊
②Nomination Form(様式 2)＊
③成績証明書(学部、大学院)
※大学院生は学部(博士課程であれば、学部と修士課程)の成績証明書も提出すること。
④英語能力証明の写し(TOEIC、TOEFL 等のスコアシート)
＊①・②の様式は下記ウェブサイトからダウンロードできます。
http://www.titech.ac.jp/enrolled/abroad/programs/short_term.html#AEARU

8. 提出期限　2017 年 5 月 24 日(水) 17 時 **厳守**
※応募にあたっては、アカデミックアドバイザー、学科助言教員、指導教員による承認(願書への押印)が必要なので、余裕を持って準備をすること。北京大学の締切とは異なるので、注意すること。

9. 問い合わせ・提出先　国際部国際連携課(南 6 号館 3 階)
e-mail: kokuren.aearu@jim.titech.ac.jp 電話:03-5734-3016
※問い合わせの際は、メールの件名を「AEARU S&E問合せ」とすること。

10. 学内選考　2017 年 5 月 26 日(金) に学内選考(面接)を実施するので、予定を空けておくこと。

11. 備考　学内選考通過者については、以下の事項に対し留意すること。
・「誓約書(様式あり。署名者:本人及び保証人等)」を提出すること。
・本学からの推薦後、主催大学へ必要書類を提出、選考を経て、参加が正式決定します。
・本学指定の海外旅行保険に加入し、その費用について海外渡航者が負担すること。
・北京大学の単位を取得した場合、この単位を東工大の単位として認定する場合には所定の審査を経る必要があります。また、認定が認められない場合もあります。

AEARU

Venue
Peking University, Beijing, China

Science & Engineering Summer Camp

Amazing Courses Available

Nine courses focus on frontiers in Electronical Engineering & Computer Science,
basic knowledges in math, algorithm or physics, engineering are needed for these courses.

Learn from World Class Faculty

Professors from CMU, Oxford, Imperial College and University of Edinburgh are invited to give lessons in this program.

Meet Extraordinary Peers Here

Students from different parts of the world will join courses and explore life in Peking University together in AEARU Summer Camp.

Explore Beijing With Us

Free visits to different parts of Beijing will be arranged during weekend.
Explore the history and culture of Beijing with us.

Tuitions and Fees

The tuition fee of RMB 10000 is waived for AEARU students.
Participants need to afford the travel, accommodation, meals, insurance and other expenses by themselves.
Accommodation subsidy is available for participants with distinguished academic performance.

How to Apply

Each AEARU university could recommend up to two students to the host university (Peking University). Both undergraduate and graduate students are eligible to apply.
Upon university nomination, participating students should complete the online application and choose up to two courses from the module before the deadline.

Deadline for Online Application

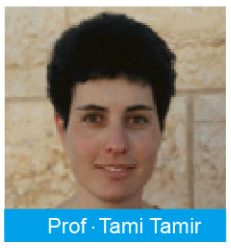
May 15, 2017

For university nomination, please contact the AEARU coordinator at your home university.

For a list and introduction of Frontier courses on Computer Science, please see our poster or visit:
http://www.oir.pku.edu.cn/summerschool/

For more inquiries regarding the program and courses, please write to:
aearuatpku2017@126.com

COURSES AND INSTRUCTORS


Prof · Tami Tamir

APPLIED ALGORITHMS

By Prof · Tami Tamir, the Interdisciplinary Center of Israel.

Date: July 3-15,2017 08:00am~12:00am

The goal of this course is to help you become better prepared to tackle algorithm design for "real-world" problems. This includes (1) being familiar with fundamental resource-allocation problems and solutions, (2) understanding algorithmic techniques and the tradeoffs involved in designing correct, efficient, and implementable algorithms, (3) understanding challenges in algorithm design for selfish users, and (4) knowing how to model and abstract messy real-world problems into clean problems that can be attacked using known paradigms or specific algorithms. Hopefully, you will gain a greater appreciation of the beauty and elegance of algorithms as well as where they are used in the real world. Specifically, we will study problems arising in production planning, operating systems, media-on-demand systems, networks, and more.

► *Prof.Tami Tamir, is the Dean of the Efi Arazi School of Computer Science at the Interdisciplinary Center of Israel. Received her Ph.D. from the computer science department at the Technion in 2001. Her research interests include design and analysis of algorithms, resource allocation problems, multimedia-on-demand systems, and algorithmic game theory. Prior to her Ph.D. studies, she was a member of the performance enhancement group of Intel in Haifa. After graduation, she spent two years as a lecturer and postdoctoral fellow at the University of Washington in Seattle.*


Prof. Zhang Hui

40 YEARS DISTRIBUTED SYSTEM RESEARCH

By Prof. Zhang Hui, Carnegie Mellon University

Date: July 3-15,2017 10:00am~12:00am

In this course, we will use a case-study-based approach to give an overview of four decades of research on operating systems and distributed systems. Topics include Concurrency, Fault Tolerence, Measurement, Storage, File Systems, Virtual Machine and Big Data. The learning objectives are:(1)To understand historical & intellectual contexts of the evolution of operating systems and distributed systems.(2)To appreciate different styles and methodologies of conducting systems research.
This course assumes a basic familiarity with operating systems concepts. Students are required to read about 2-3 research papers each day, write reviews and actively participate in class discussion.

► *Prof. Zhang is a Professor in the Computer Science Department at the School of Computer Science at Carnegie Mellon University.He is also Co-Founder and CEO of Conviva Inc. During 2000 - 2003, He was the Chief Technical Officer of Turin Networks (merged with Force 10 Networks in 2009 and acquired by Dell in 2011).Prof Zhang's research interests lie in Internet, multimedia systems, resource management and quality of service.*


Anthony W. Lin

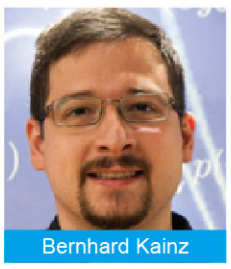
LOGIC AND VERIFICATION

By Anthony W. Lin, Associate Professor at Oxford university

Date: July 3-14,2017 13:00~17:00

Logic is an indispensable tool in computer science and is used in every facet of the field. One may even argue that computers are built on top of logic (logic gates are the basic building blocks of computers). This course introduces fundamental concepts in logic in computer science with applications in algorithmic verification of computer systems, a field that was pioneered by 2007 Turing Award Winners (Clarke, Emerson, and Sifakis).
We will discuss propositional logic, first-order logic, temporal logics, their basic algorithmic problems (e.g. model checking and satisfiability), and how they can be applied for reasoning about computer systems (hardware, software, etc.). The course requires students to do both mathematical proofs and programming.

► *Anthony W. Lin is an Associate Professor in Programming Languages at University of Oxford Department of Computer Science and an Official Fellow at Kellogg College. Prior to joining Oxford, Lin was an assistant professor in computer science at Yale-NUS College (National University of Singapore). Broadly speaking, he is interested in all aspects (ranging from theory to systems) of the development of principled techniques that can make software less error-prone, and more efficient.Lin was a winner of Google Faculty Research Award (2017), EPSRC Research Fellowship (2010-2013), and LICS Kleene Award (2010). He regularly publishes, reviews, and serves in the program committee at premier conferences in the areas including CAV, CONCUR, FoSSaCS, ICALP, LICS, OOPSLA, POPL, and TACAS.*


Bernhard Kainz

COMPUTER GRAPHICS AND ADVANCED TOPICS

By Bernhard Kainz, Lecture at Imperial College London

Date: July 3-14, 2017 13:00~17:00

This course covers the fundamental principles of computer graphics and advanced concepts and their use in prominent applications. After the course you will:(1)understand principles of computer generated imagery;(2)understand advanced issues related to customising programmable shading pipelines - such as vertex, fragment, and geometry shading stages;(3)understand the ideas behind surface geometry representation, 3D geometry, polyhedral rendering and ray-based image generation methods;(4)be able to solve a given computer graphics problems by going through the basic steps of rendering pipeline specification, algorithm selection, analysis and implementation;(5)be able to competently read 'foreign' OpenGL GLSL source code and computer graphics pipeline diagrams;(6)have developed solid understanding of the mathematical principles of computer graphics and the ability to put in practice the acquired knowledge and understanding.

► *Bernhard Kainz is Lecturer in the Department of Computing at Imperial College London. He is researching translational high-performance medical data analysis and interactive real-time image processing techniques as member of the Biomedical Image Analysis, BioMedIA Group in the section of Visual Information Processing. He collaborates intensively with King's College London, Division of Imaging Sciences and Biomedical Engineering, St. Thomas Hospital London and the department of Bioengineering at Imperial.*


Ye Fan

MOBILE SENSING SYSTEM AND APPLICATIONS

By Ye Fan, Assistant Professor at Stony Brook University

Date: July 10-21,2017 8:00~9:50

This is a research oriented course focusing on recent advances and developments in mobile sensing systems and their applications, especially those leveraging modern mobile devices and embedded sensors. Topics include: Indoor Location Sensing, Mapping and Navigation, Acoustic Sensing, Transportation, Human Activity, Wearable Devices, Millimeter Wave Sensing, Fitness and Health.
Students need to read latest literature and write reviews, discuss pros/cons of research papers, work on research problems and develop solutions, present their work in formal reports. The practice of the basic research skills are major components. The course intends to be self-sufficient and prior experiences in programming, mobile devices and embedded systems is a plus.

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Prof. Bob Coecke

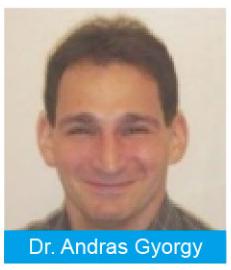
PICTURING QUANTUM PROCESSES

By Prof. Bob Coecke, Oxford University

Date: July 10-21,2017 13:00~17:00

This course provides an interdisciplinary introduction to the emerging field of quantum computer science, explaining basic quantum mechanics (including finite dimensional Hilbert spaces and their tensor products), quantum entanglement, its structure and its physical consequences (e.g. non-locality, no-cloning principle), and introduces qubits. We give detailed discussions of some key algorithms and protocols such as Grover's search algorithm and Shor's factorization algorithm, quantum teleportation and quantum key exchange. At the same time, this course provides an introduction to diagrammatic reasoning. As an entirely diagrammatic presentation of quantum theory and its applications, this course is the first of its kind.

► *Bob Coecke is Professor of computer science at the University of Oxford,and fellow of Wolfson College.He is interested in the Foundations of Physics, in particular the structures involved, with a strong structural bias towards Logic, Order and Category Theory, and their applications.He leads a multidisciplinary research group, the Quantum Group, which now has 50 plus members. Nearly 1,000 pages of monographs co-authored with Kissinger were published at Cambridge University Press, which will be selected as a textbook.*


Dr. Andras Gyorgy

ADVANCED MACHINE LEARNING: ONLINE LEARNING AND OPTIMIZATION

By Dr. Andras Gyorgy, Senior Lecturer at Imperial College London

Date: July 12-21,2017 8:00~12:00

Designing autonomous systems that can adapt to their environments is arguably one of the most important goals in computer science and engineering. In some cases the environment is too complex to be modeled, and the best is to take a robust approach: continuously optimize the system as it interacts with its environment. Online learning, a subfield of machine learning, provides the theoretical foundations to solve such problems. The course will provide an introduction to online learning, covering the basic techniques and ideas. We will also discuss its connections and applications to other areas of machine learning, as well as how the same techniques lead to efficient methods for large scale optimization.

► *Dr. Andras Gyorgy was a Visiting Research Scholar in the Department of Electrical and Computer Engineering, University of California, San Diego, USA, in spring of 1998. In 2012-2015, he was a researcher in the Department of Computing Science, University of Alberta, Edmonton, AB, Canada. He joined the Department of Electrical and Electronic Engineering of Imperial College London, London, UK, where he is currently a Senior Lecturer. Dr. György received the Gyula Farkas prize of the János Bolyai Mathematical Society in 2001 and the Academic Golden Ring of the President of the Hungarian Republic in 2003.*


Prof. Leonid Libkin

ADVANCED TOPICS IN FOUNDATIONS OF DATABASES

By Prof. Leonid Libkin, University of Edinburgh

Date: July 24-28, July 31, August 1, 2017 13:00~17:00

The course is about foundations of big data. It aims to prepare students for conducting research in the areas of querying and managing big data, and expose them to current research and development in connection with big data theory. This course will cover fundamental issues in connection with three of four big V's in the typical characterization of big data, namely, Volume, Variety and Veracity.

► *Leonid Libkin is Professor of Foundations of Data Management in the School of Informatics at the University of Edinburgh. He was previously a Professor at the University of Toronto and a member of research staff at Bell Laboratories in Murray Hill. His main research interests are in the areas of data management and applications of logic in computer science. He has written five books and over 200 technical papers. His awards include a Marie Curie Chair Award, a Royal Society Wolfson Research Merit Award, and five Best Paper Awards. He has chaired programme committees of major database conferences (ACM PODS, ICDT) and was the conference chair of the 2010 Federated Logic Conference. He has given many invited conference talks and has served on multiple program committees and editorial boards. He is an ACM fellow, a fellow of the Royal Society of Edinburgh, and a member of Academia Europaea.*


Prof. Chen Shigang

COMPACT DATA STRUCTURES FOR BIG DATA

By Prof. Shigang Chen, University of Florida

Date: July 28 -August 4,2017 8:00~12:00

The course teaches compact data structures and corresponding algorithms, probabilistic methods, and statistical tools for handling big data (especially big network data). At present the largest big data may be the data flow on the Internet. The analysis of big data can provide a theoretical basis for improving the network performance, network user experience and network security. However, network big data can not be retained. In this context, this course teaches a series of compact data structures and their theoretical analysis that have evolved over the past 30 years , which can be used to make big data smaller for storage and application.

► *Prof. Chen received his M.S. and Ph.D. degrees in Computer Science from University of Illinois at Urbana-Champaign in 1996 and 1999, respectively and B.S. degree in Computer Science from University of Science and Technology of China in 1993. He joined University of Florida as an assistant professor in 2002, and was promoted to associate professor in 2008 and to professor in 2013. He was a recipient of IEEE Communications Society Best Tutorial Paper Award in 1999, NSF CAREER Award in 2007, and Cisco University Research Award in 2007, 2012. He published 140+ peer-reviewed journal/conference papers and hold 12 US patents. Currently he serves as an associate editor for IEEE/ACM Transactions on Networking and IEEE Journal of RFID. He is an IEEE Fellow.*