

Newsletter

International Society of Bionic Engineering

Volume 5, Issue 1, 2016



Contents

1-Members

03 Chris Rudd

05 Zhiwu Han

06 Application for
Membership

2-News and Events

07 ICBE'16 was held in Ningbo, China

08 Specialist Short Courses 2016

09 Professor Bharat Bhushan and Researcher
Philip Brown Win 2015 IChemE (UK)
Global Award

10 New Book: Ocean Innovation

11 Bio-inspired engineering research
receives international recognition

12 New Book: Design, Fabrication,
Properties and Applications of Smart
and Advanced Materials

3-Academics

13 Mechanism for biologically inspired four
legged robotic vehicle

14 Bionic coupling design for the
multi-toothed cutting tools

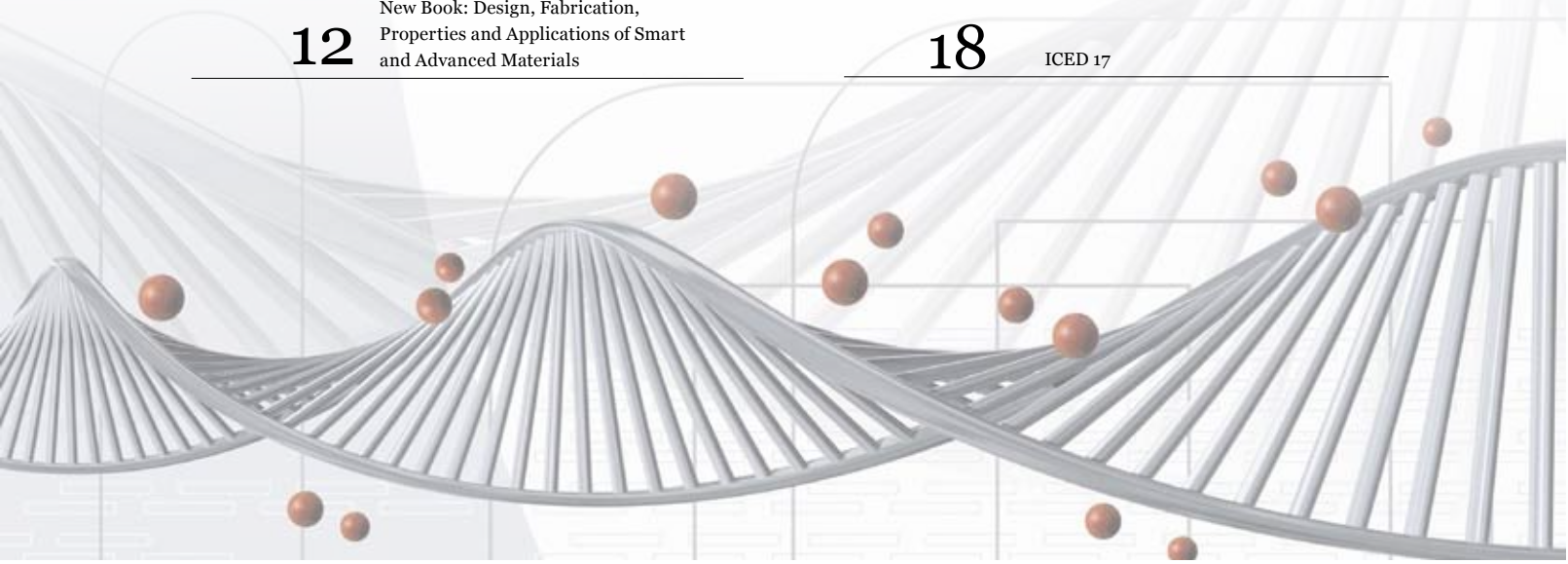
15 Nature publishing works of biomimetic
surface from Professors of Beihang
University

4-Upcoming Activities

16 Biomimicry and bio-inspired Innovation

17 ROBIO 2016

18 ICED 17





Professor Christopher Douglas Rudd

External Appointments

- * ISBE – Board Member
- * Science City Nottingham – Board Member
- * East Midlands Science and Industry Council – Board Member
- * Composites Part A (Elsevier) - Applied Science and Manufacturing – Editorial Board
- * Nottingham Technologies Asia (Hong Kong Registered Company) – Director and Chairman
- * MyRIAD Holdings (Malaysian Registered Company) - Director
- * Manufacturing Technology Centre (MTC) – Main Board Member
- * Sino-UK Sustainable Cities Collaboration (Co-Chair)
- * Guest Professor – Jilin University (China)
- * The China-Britain Business Council (Board Member)

Summary

Chris Rudd began his career as a sea-going engineer with P&O Steam Navigation Company. He graduated from Newcastle Polytechnic in 1985 with First Class Honours in Mechanical Engineering and went on to gain a PhD in 1989 from the University of Nottingham. He was

appointed to UoN's academic staff in the same year and was awarded a personal Chair in 1997.

After 5 years as Dean of the Faculty of Engineering, Chris was appointed Pro Vice Chancellor in 2008. Until 2015 his portfolio External Engagement included Knowledge Transfer, Business Engagement, Commercialisation, Development and Alumni Relations. He oversaw UoN's Research and Knowledge Transfer Strategy, a £150M philanthropic fundraising campaign and the re-structuring Business Engagement and Innovation. He established UoN's Innovation Park and its intellectual property and spinout boards. He is a founding Director of UK's £40M Manufacturing Technology Centre and won several awards for innovative use of media in public engagement.

Chris has driven UoN's research and KE partnerships in China since 2008 resulting in new relationships with several elite Chinese Universities and a rapidly growing portfolio of SOEs and private companies. He has been a guest Professor of Jilin University and a Changbaishan Scholar. He was awarded the 48 Group Club Icebreaker Laureate prize for ser-

vices to Sino-UK relations and led Nottingham Confucius Institute to Model status, awarded by Vice-Premier LIU Yandong in 2015.

Chris sits on the CBBC Board, was a panel member of the UK Government's 2012 Review of Business-University Collaboration and worked closely with Sir Andrew Witty on the 2013 UK Government Review of Universities and Growth. In August 2015 he accepted the role of Provost at University of Nottingham Ningbo China and is currently based in China where he oversees the growth and development of China's first and most successful Sino-Foreign University.

Statement on Research

Professor Chris Rudd focuses on the processing of polymer matrix composites and the associated process-property interactions. Virtually all of the work has been done with long (or continuous) fibre systems and this has involved experimental characterisation, modelling and simulation. The early work was stimulated by the automotive industry where the simultaneous demands for mass production, high process throughput, low statistical variation and minimum unit costs provide severe technical challenges. He has concentrated mainly on materials and processes for body structures. A combination of applied engineering science and process monitoring has been used over

the years to analyse the critical aspects of fabric impregnation, mould filling or thermoforming in order to identify rate (and cost) limiting steps and to determine how these practical difficulties can be overcome, without prejudicing structural performance. These core studies have led to process innovations that have been taken up by sponsors and in other cases spin-off activities that have been pursued within our group.

Much effort was spent on liquid moulding and its variants for fabricating thermoset composites. Later, pressures on cycle times and recyclability have stimulated interest in sheet forming thermoplastics. The two process families share common issues of impregnation, consolidation and forming – both impinging on the critical problems of mechanical property prediction and cycle time (or process economics). One of the key features of the work has been the linking of process models with property predictions, especially those fibre dominated properties, via an understanding of the physical processes that occur during fabrication.





Professor Zhiwu Han

** Member of the Board of Directors & Fellow of the ISBE*

** Chang Jiang Scholar*

** The National Science Fund for Distinguished Young Scholars*

Zhiwu Han is a professor in Bionic Science and Engineering, and Dean of the Key Laboratory of Bionic Engineering (Ministry of Education), Jilin University. His research interests include biomimetics and simulation, functional surface biomimetics, biomimetic sensors and bionic technology in engineering.

He is a distinguished professor of the Chang Jiang Scholars Program, The National Science Fund for Distinguished Young Scholars, the State Candidate of Millions of Talents Project in the New Century, the Cross-century Excellent Talents of Ministry of Education, and an Expert of the State Council Special Allowance. He was Senior Visiting Scholar at Oxford University in the UK. He is the State Representative of the International Society of Bionic Engineering (ISBE).

Dr. Han has four scientific and technological awards on the state and provincial level and two international academic awards. He has authorized 20 state invention patents, and taken charge of 15 projects at the state and pro-





Prof. Han is the Editor-in-chief of *Journal of Advanced Biotechnology and Bioengineering*, Associate Editor of *International Journal of Complex Systems-Computing, Sensing and Control (IJCS)*, the editorial Board Member of *Journal of Bionic Engineering*, and the editorial Board Member of *Tribology*.

vincial levels. He has published more than 150 articles, of which 90 are indexed in SCI. Some of these articles were featured on the front cover of *Science China* (IF=1.192), *Nanoscale* (IF=7.394) and *Small* (IF=8.368).

His research results have attracted attention in science and technology, industry, aviation and business, and were highly rated and reported in long interview by more than 60 famous domestic and overseas science and technology magazines or web sites, including NSFC, ACS News Service Weekly Press Pac, *Scientific American*, *Science Daily*, *Eurek Alert* and *The Economist*. ACS News Service Weekly reported in Press Release. They reported that in an effort to develop better erosion-resistant surfaces, Prof. Han and his group sought the secrets of the yellow fat tail scorpion (*Androctonus australis*) for the first time. His research results have been cited and evaluated positively at great length on more than 50 journals by some world famous scientists such as Prof. D. Fowler (FRS) and Prof. W. Barthlott (Fellow of the Germany Academy of Science) from 30 countries.

Application for Membership

The ISBE was established in 2010 to foster the exchange of information in bionic engineering research, development and application. There are currently 940 members from 51 countries and regions of the world. By becoming a member of the ISBE you can communicate with more academic elites and enjoy a variety of benefits. Membership of the Society is free of charge. We welcome your colleagues and friends to join the society. It is our hope that we can establish and develop the ISBE together.

We welcome your application for membership, online at: <http://www.isbe-online.org/>

Welcome to Join ISBE !

ICBE'16 held in Ningbo, China



The 5th International Conference of Bionic Engineering (ICBE'16) was held in Ningbo on June 21-24, 2016. The conference was organized by the International Society of Bionic Engineering (ISBE) and sponsored by National Natural Science Foundation, the University of Nottingham (UK), the University of Nottingham Ningbo China and Jilin University (China). The conference provided an international forum for scientists and engineers who are working in the field of bionic engineering, and also for dissemination of information and knowledge exchange in biomimetics and bionic engineering.



The Chairman of the conference was Professor Yuying Yan from the University of Nottingham, UK. Nearly 300 representatives from 24 countries and regions attended the conference, from UK, USA, Germany, Canada, Australia, Austria, Japan, South Korea and China among others. They showed their latest academic achievements on bionic engineering and ex-

changed points of view on the topics of biomechanics, bionic structures, biomimetic materials, biomimetic surfaces, fluids flow and drag reductions, nature inspired designs, industrial applications in biomimetics, sensors and signal processing, energy systems, robotics, motion systems and artificial intelligence.

The Second Bionic Engineering Award Ceremony was held during the conference. Prof. Daniel Weihs from Israel Institute of Technology and Prof. Yongmei Zheng from Beihang University (China) got the Outstanding Contribution Award, Prof. Zuankai Wang from City University of Hong Kong and Prof. Zhiguang Guo from Lanzhou Institute of Chemical Physics, Chinese Academy of Sciences



(CAS) got the Outstanding Youth Award, Dr. Hamed Rajabi Jorshari from Kiel University (Germany) and Jianing Wu from Tsinghua University (China) got the Outstanding Student Award. The Executive Board of Directors of ISBE and the Editorial Board of Journal of Bionic Engineering also met during the conference.



The great success of ICBE'16 not only expressed the current research achievements in Bionic Engineering but also offered a platform for representatives to communicate and cooperate with each other. It would greatly push forward the development of bionic engineering worldwide.



Specialist Short Courses 2016

Specialist Short Courses 2016 organized by the International Society of Bionic Engineering (ISBE) were successfully held in University of Nottingham Ningbo China on June 20-21, 2016. The courses were presented by Julian Vincent of Oxford University. He is a distinguished professor on Bionics and the President of ISBE. Nearly 30 scholars and postgraduates attended the courses. During the two days' innovative teaching methods included specialist tutelage, classroom interaction and practical experience. The topics were methods in biomimetics and structural biological materials.

The courses not only provided favorable opportunities for attendees to learn the basic methods and skills of biomimetics but also offered a platform for academic communication and cooperation. They played a positive role to popularize bionic science and technology, spreading its ideas, methods and spirit, and accelerating the pace of academic research and development.



Professor Bharat Bhushan and Researcher Philip Brown Win 2015 IChemE (UK) Global Award

Bharat Bhushan, member of ISBE, Ohio Eminent Scholar, and postdoctoral researcher Philip Brown were presented with an IChemE Global Award on November 5 at the Chemical Engineer's (IChemE) Global Awards 2015 in Birmingham UK, recognizing outstanding achievement in chemical and process engineering in the Water Management and Supply category for their research, "Separating oil from water." The black-tie event was attended by more than 450 people from 18 countries, hosted by BBC business journalist, Steph McGovern, at the Hilton Metropole.

A new mesh has been developed with a coating that contains thousands of tiny holes acting like a colander. When a mixture of oil and water is poured over the treated mesh, the oil gets trapped but the water passes straight through, separating the liquids and helping to clean oil spills. The research was done at Ohio State University's Nanoprobe Laboratory for Bio- and Nanotechnology and Biomimetics.

"Oil spills are devastating to natural habitats and wildlife," says Professor Bhushan. Today, oil spills are sometimes handled using dispersants more toxic than the oil itself. Additionally, the emergence of fracking has shed new light on industrial water contamination. We developed a durable coating that, when applied to a mesh or membrane, can help reduce the environmental impact of various industries by separating oil from water."

The work began more than 10 years ago when Bhushan began building and patenting nano-structured coatings that

mimic the texture of the lotus leaf. Since then, he and his team have worked to increase the effect and tailor it to different situations."

"Nature reaches a limit of what it can do," said Brown. "To repel synthetic materials like oils, we need to bring in another level of chemistry that nature doesn't have



access to.”

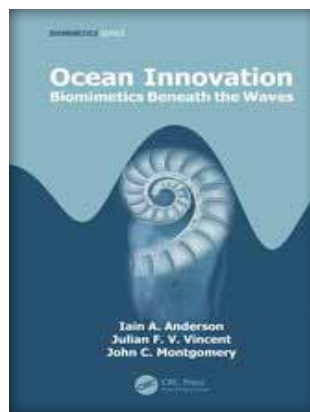
To learn more about the research, please see the video below.

Ohio State University's winning entry, one of 500 entries from five continents, was awarded by IChemE's Water Special Interest Group. IChemE's president, Andrew Jamieson, congratulated the diverse range of winners from industry and academia. The IChemE Global Awards, held in partnership with Aramco, celebrate and recognize excellence in chemical engineering worldwide.



About IChemE

The Institution of Chemical Engineers (IChemE) is the global professional organization for people with experience or an interest in chemical engineering. With a growing membership of over 42,000, IChemE is at the heart of the process community, promoting competence and a commitment to best practice, advancing the discipline for the benefit of society, encouraging young people in science and engineering and supporting the professional development of its members. IChemE is the only organization to award Chartered Chemical Engineer and Professional Process Safety Engineer status.



New Book: Ocean Innovation

Biomimetics Beneath the Waves

by Iain A. Anderson; Julian Vincent;
John Montgomery

CRC Press; 188 Pages ISBN 9781439837627

Biomimetics is the idea of creating new technologies abstracted from what we find in biology. *Ocean Innovation: Biomimetics*



Beneath the Waves seeks that technological inspiration from the rich diversity of marine organisms.

Bringing both a biological and an engineering perspective to the biomimetic potential of oceanic organisms, this richly illustrated book investigates questions such as:

How can we mimic the sensory systems of sea creatures like sharks, sea turtles, and lobsters to improve our ability to navigate underwater? How can we become invisible to marine life? How can we diffuse oxygen from water to enable deep diving without the risk of decompression sickness?

Each chapter explores an area where we, as divers and technologists, can benefit from understanding how animals survive in the sea, presenting case studies that demonstrate how natural solutions can be applied to mankind's engineering challenges.



Award recipient Dr. Yahua Liu (right) and his supervisor Dr. Zuankai Wang (left)

Dr. Liu Yahua, a Ph.D graduate from City University of Hong Kong, was awarded the Hong Kong Young Scientist Award in the Engineering Science category for his work entitled “Bioinspired interfacial materials: engineering and application”. He has published four papers in Nature Physics and Nature Communications over the past two years, two of them as the first author.

“One central question for making robust super-wetting surfaces is maximizing water repellence or minimizing the contact time of a droplet with the solid surface. However, there is a minimum contact time which is imposed by classical hydro dynamics. I developed two kinds of millimeter-scale super-wetting surfaces, which allow for ~80%

Bio-inspired Engineering Research Receives International Recognition

reduction in the contact time.” says Dr. Liu.

The Award is based on evidence of research excellence in science or technology, as well as the potential to be a good scientist or engineer. After rigorous review by a panel of distinguished experts and scholars, Dr. Liu was declared the winner of the Award out of 32 applications in the category of Engineering Science.

Dr. Liu is now an Associate Professor in the Department of Mechanical Engineering at Dalian University of Technology, a key national university under the direct administration of the Ministry of Education. Continuing his work, he leads a team exploring practical applications of the new material for surfaces related to self-cleaning, anti-icing on aircraft, car and power transmission lines, and drop wise condensation to enhance heat transfer.

Send an email to ISBE Secretariat

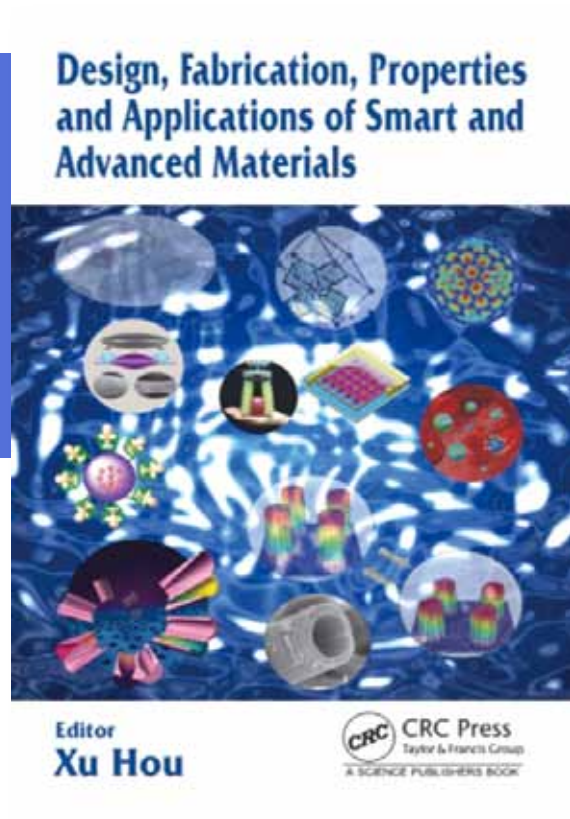
ISBE Secretariat is always calling for news and ideas among our members, if there is any information you would like to include in a future edition of newsletter, please feel free to contact us.

Email: secretariat@isbe-online.org;

office@isbe-online.org

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Address: 1202 Administrative Building, Jilin University, 2699 Qianjin Street, Changchun P. R. China



Editor

Xu Hou is a professor at Xiamen University (<http://xuhougroup.xmu.edu.cn/>). He received his B.S. degree (2006) from Sichuan University, China.

His scientific interest was materials of tissue engineering. He completed his Ph.D. (2011) at National Center for Nanoscience and Technology, China, under the direction of Prof. Lei Jiang. His scientific interests were focused on the design and fabrication of biomimetic micro/nanochannels.

His current researches focus on bio-inspired microfluidics. As a researcher, Xu has published 2 Books and 30 research papers (Google scholar 2016 total cited >1800, H-index:19), such as *Nature*, *Chem. Soc. Rev.*, *J. Am. Chem. Soc.*, *Angew. Chem. Int. Ed.*, *Adv. Mater.*, *ACS Nano*, *Chem. Commun.*, *Adv. Funct. Mater.*, and *Small*, etc, and highlight by *Nature*, *Nature China*, etc.

In 2013, he published his first academic book at Springer for recognition of outstanding PhD research and got the Springer Theses Prize. In 2014, he received the Harvard Postdoctoral Award for Professional Development, in honor of excellence and achievement in academic research (at Aizenberg's group). He has been awarded 2014 SciFinder Future Leader in Chemistry Program of the American Chemical Society.



New Book: Design, Fabrication, Properties and Applications of Smart and Advanced Materials

Summary

This book introduces advanced, smart, bio-inspired materials and the strategies for their design and preparation for novel uses from macro to micro or from biological, inorganic, organic to composite materials.

Selecting the best material is a challenging task, requiring trade-offs between various material properties and designing functional smart materials. The development of advanced materials and their applications is a burgeoning area of research. Exciting breakthroughs are anticipated from the concepts and results reported in this book.

Features

- Reviews the latest research progress and the most recent developments in the field of smart materials
- Presents a new understanding of the fabrication and properties of smart, advanced, bio-inspired materials
- Showcases applications of smart materials in diagnostic medicine, renewable energy, self-healing materials and controlled drug release
- Offers comprehensive background knowledge for a variety of readers ranging from undergraduates to professional scientists

Mechanism for a biologically inspired four legged robotic vehicle

Riyaz Rafique¹, Sumit Kumar², Sri Narayan² and Kamod Kumar Sah² ¹Email: riyaz_rafiq@yahoo.com

¹Assistant Professor, ²4th Year Bachelor of Engineering Degree Students, Mechanical Engineering, Department of Mechanical Engineering, School of Engineering, Sri Satya Sai University of Technology & Medical Sciences, Sehore, M.P., INDIA

The hippopotamus was identified as a vulnerable species in the Red List drawn up by the International Union for Conservation of Nature and Natural Resources (IUCN). Our project had the objective of raising awareness of the hippopotamus by developing a legged robotic vehicle imitating its gait. The main aim was to develop a four legged vehicle with only rotary joints utilizing the least number of actuators. The leg mechanism is inspired by the work “Adjustable mechanism for walking robots with minimum number of actuators”, by Professor Anirban Guha and Professor C. Amarnath.

The leg mechanism has a single degree of freedom and is a combination of a Hoecken mechanism and a parallel mechanism. The parallel mechanism follows the curve traced by the Hoecken mechanism to achieve the straight side of the foot trajectory along the ground. In this project there are two actuators powering four legs. One actuator powers the two left legs and other powers the two right legs. The cranks of the front right leg and the rear left leg are parallel; the other two cranks are 180 degrees out of phase with the first two cranks.

Figure 1 is a front view of a single degree of freedom leg mechanism in which the grounded link is shown in black, the crank is shown in red and the leg is in magenta. The trajectory of the foot over a complete rotation of the crank is shown in cyan.

This model took first prize in a national level

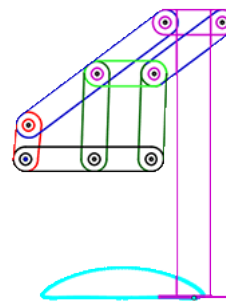


Fig. 1: Front view of single degree of freedom leg mechanism



Fig. 2: Prototype of Biologically inspired four legged robotic vehicle

technical festival “Technospark 2k16”, held at Sri Satya Sai University of Technology & Medical Sciences, Sehore, Madhya Pradesh in the event “Robomania”, a robotics competition held on 25-26th April, 2016. In Robomania a robot with the best features was the winner. A fully functional prototype was demonstrated at the event. The low cost prototype was manufactured at the Sri Satya Sai University of Technology & Medical Sciences, Sehore, Madhya Pradesh, India. The students and the mentor gratefully acknowledge the help from Sri Satya Sai University of Technology & Medical Sciences, Sehore, Madhya Pradesh.

Bionic coupling design for multi-toothed cutting tools

Yunhai Ma, Jilin University, China

Sawing is the preferred method in a variety of industries for cutting raw materials into sizes. Compared to other mechanical cutting such as wire cutting it has high removal rates of metal and a competitive surface finish. During cutting, there is more than one cutting edge in contact with the workpiece at any time. Such multi-toothed cutting processes include milling, sawing, drilling and broaching. They differ in average cutting parameters and in the main type of motion. They also differ regarding the engagement of the cutting edge with the workpiece, being continuous or interrupted.

The survival and function of dentition over the lifetime of an animal depends upon the ability of the teeth to resist wear and chemical erosion, and to withstand occlusal loading without fracturing. Their geometrical factors (radius, height, enamel thickness) and mechanical properties of the dental tissues (Young's modulus, hardness and toughness of enamel and dentin) combine to ensure the longevity of an animal's teeth.

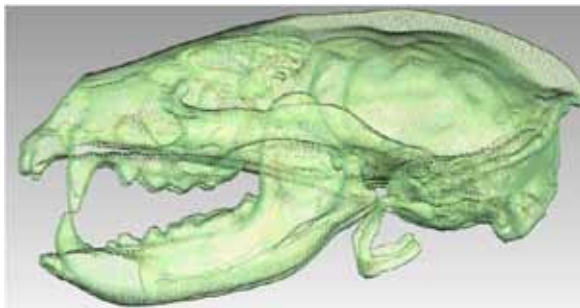


Fig. 1: The three-dimensional model of badger head

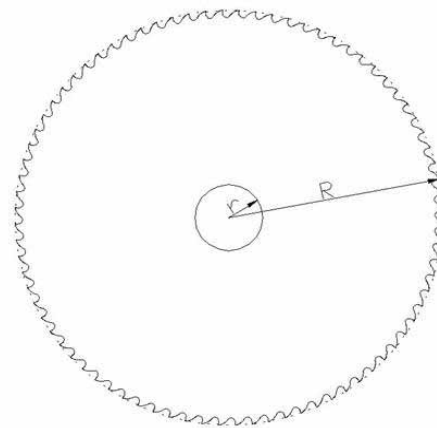


Fig. 2: A bionic circle saw



Fig. 3: A bionic cutting band saw

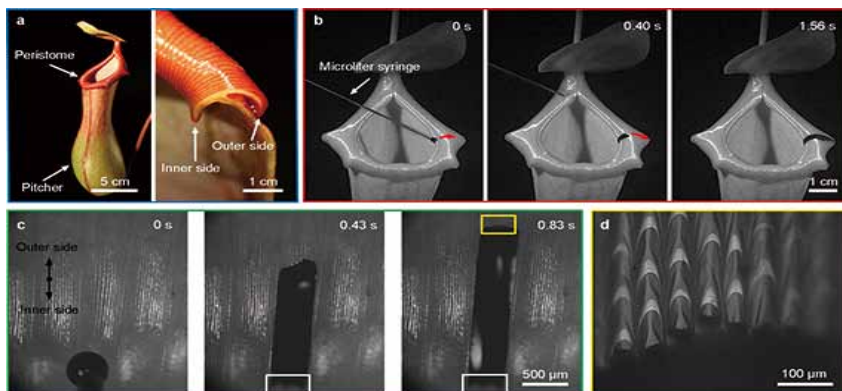
Badgers have sharp teeth, and can easily bite through wire. When biting they show low frictional resistance, low power consumption and low wear. On the basis of research on the characteristics of badger teeth (Fig. 1), our group explored bionic design theories and techniques for multi-toothed cutting tools (Fig.2 and Fig. 3). Using these observations on the structure of badger teeth, their alignment and occlusion, material properties, contours, kinematic characteristics, material composition, hierarchical structure, mechanical and tribological properties, we analyzed the mechanisms coupling structures and materials when badger teeth cut food.

Nature publishing works of biomimetic surface from Professors of Beihang University

On April 7, 2016, Nature published a paper entitled “Continuous directional water transport on the peristome surface of *Nepenthes alata*”. The main authors of this paper are professors of Chen Huawei, Zhang Deyuan, from School of Mechanical Engineering and Automation of Beihang University, and academician of Jiang Lei from the School of Chemistry and Environment of Beihang University. This work is the first paper published in Nature in fields of mechanical engineering of Chinese universities. The research studies unidirectional water transport on the peristome surface of *Nepenthes alata*, and offers a new concept for making materials and surfaces that can transport water directionally, giving insight into anti-adhesion in medical instruments.

Combining micro- and nano- structures with surface materials endows the surface with a unique capacity, i.e., functional surface techniques, gradually becomes a new and important approach to solve the problems plagued with in fields of mechanical engineering, such as drag reduction, antifouling, and anti-bacteria. Nature has evolved lots of surface structures with excellent functions as a result of natural selection, and understanding the mechanism of these functions may bring new insights to accelerate technical innovation.

The surface of the peristome of *N.alata*is permanently wet, so that insects crawling on it skid (technically, aquaplane), the lack of grip allowing an insect to slide easily into the pitcher.



Previous studies have investigated the effects of the water film on the insect and characterized the surface morphology, although hardly any of them involved the surface-material-function relationship. Chen et al. first found directional water transport on the peristome surface of *N. alata* by observing the movement of water on the surface after being deposited. By in situ observation and analysis of the surface structure of the peristome, they found that this water movement results from its multiscale structure, which optimizes and enhances capillary rise, and prevents backflow. By changing the wettability of a replica of the peristome surface, they also found that hydrophilicity is crucial for directional water transport, which didn't happen on the hydrophobic replica. This reported directional water transport is much faster than observed in previous studies. The mechanism underlying this phenomenon might find use in applications that call for directional fluid transport—for example, in non-powered self-lubrication in mechanical engineering, MEMS, agricultural drip irrigation, anti-adhesion of medical instruments or in the non-powered delivery of microdrugs.



Biomimicry specifically and bio inspired innovation more generally offer promising way towards more sustainable and ultimately regenerative societies to co-exist with the natural world. Researchers are uncovering more of the amazing feats that nature realizes and businesses are tapping into those insights to make their products, processes and organizations more sustainable. This conference aims to share experiences and explore together what may be done to achieve more impact with biomimicry and bio inspired innovation by aligning research and practice.

We sincerely welcome innovators, researchers, entrepreneurs, students, decision makers, designers and anyone else interested in biomimicry and bio inspired innovation. There are several registration options, for people who simply want to get acquainted through a network dinner as well as people who want to be inspired by examples from practice or dive deep into implementation. The conference will be organized with one dedicated biomimicry track, curated with all biomimicry partners, and additional tracks with related research, theories, methods, tools and more bio inspired practice.

CONFERENCE OVERVIEW

Friday - Welcome to Utrecht and networking

Afternoon: optional walking tour around the historical and charming city of Utrecht or Botanical Gardens Utrecht

Evening: official welcome with guided tour and drinks at the Museum Speelklok and walking dinner with stimulating perspective talks

Weekend - two day conference

Saturday and Sunday start with keynote speakers, feature four rounds of sessions in the afternoon and conclude with a plenary session.

Both days will have a primary dedicated biomimicry track and additional bio-inspired innovation, research, theory/methods/tools parallel tracks.

Saturday - Biomimicry meme for a regenerative society

Conference day will focus on experiences and results from research and business.

We conclude with an inspirational dinner party at the historical University Hall

Sunday - Biomimicry practice – facilitating impact

Sunday will focus on using and improving knowledge and tools for biomimicry education and application in business

Free evening in Utrecht

Monday; co-create

For parties wanting to spend some time together we can make work spaces available on request.

CO-CREATED WITH

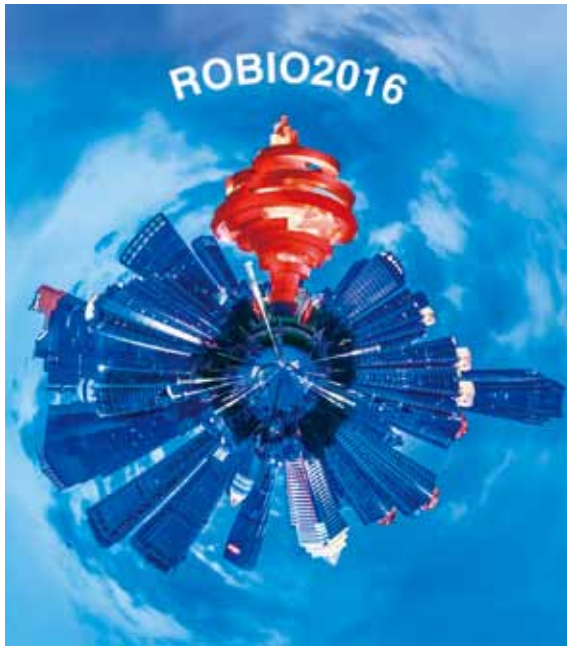


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More Information, please visit <http://www.cvent.com/events/global-conference-on-biomimicry-and-bio-inspired-innovation-2016/event-summary-18ba070552954caa9181a743f9db9428.aspx>



The IEEE ROBIO 2016 conference will take place from **Dec. 3 – Dec. 7, 2016** in Qingdao, China. Qingdao is a civilized and sanitary city, and ranks among the top 10 of economically dynamic and excellent business cities in China. It is also the Chinese center for marine research, the first city for national technology innovation pilot projects, a national model city for environmental protection and a national garden city. It has won the “Chinese Habitat’s Best Practice Prize” as well as “China Investment Environment Gold Medal City”. The theme of the ROBIO 2016 conference is “Robots Serve for the Ocean”, reflecting the ever growing interest in research, development and applications in the dynamic and exciting areas of ocean applications and robotics, such as aquaculture, ocean observation and biomimetics. ROBIO 2016 promises to be a great event for researchers and scholars in robotics and biomimetics, with attractive technical and social programs. The conference invites high quality original research and development papers in all areas related to robotics, biomimetics and related topics.

Advisory Committee Chair

Tzyh-Jong Tarn (Washington University, USA)

General Chair

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Co-Chairs

Satoshi Tadokoro (Tohoku University, Japan)

Zhidong Wang (Chiba Institute of Technology, Japan)

Program Chair

Atsushi Yamashita (University of Tokyo, Japan)

Co-Chairs

Kazuhiro Kosuge (Tohoku University, Japan)

Aiguo Ming (University of Electro-Communications, Japan)

Contributed Papers

Original papers are solicited in all related areas of robotics and biomimetics. Full papers must be submitted in pdf format prepared strictly following the IEEE pdf requirements for creating pdf documents for the IEEE Xplore. For detailed format information, please visit the conference website. All accepted and presented papers will be indexed by EI and included in IEEE Xplore.

Tutorials & Workshops

Proposals for tutorials and workshops addressing new topics in robotics and biomimetics are also invited.

Important Dates

July 16, 2016

Deadline of Full Paper

Sep. 23, 2016

Notification of Acceptance

Oct. 8, 2016

Deadline of Final Submission

Sponsors

IEEE Robotics and Automation Society

Shandong Robotics Society

Qingdao Municipal Government

Tianjin University

Ritsumeikan University



Photo Credit: Native youth participants of the Overly Creative Minds arts studio at the Urban Native Youth Association, under the guidance of artist and OCM Coordinator Marie Wustner

ICED17

21st International Conference on Engineering Design 2017
August 21-25, 2017 Vancouver, Canada

Web: <http://iced17.org/>

Welcome!

We are pleased to invite you to prepare and submit papers to the 21st International Conference on Engineering Design, ICED17.

The conference will be held on the campus of the University of British Columbia from Aug. 21-25, 2017.

In keeping with the critical nature of natural and human resources to Canada, and especially to the province of BC, the overarching theme of ICED17 is “Resource-Sensitive Design”.

We will have special events and activities to showcase this theme as it is interwoven throughout the workshops and sessions that will span the traditional ICED topics.

All of us on the Organising and Programming Committees welcome you warmly to ICED17 in Vancouver!

-Mike Van der Loos, Conference Chair

IMPORTANT DATES

Aug. 1, 2016: Paper Submission Open

Dec. 19, 2016: Full Paper Deadline

Mar. 15, 2017: Notifications of Paper Acceptance

Mar. 15, 2017: Registration Opens

Apr. 24, 2017: Camera-Ready Paper Deadline

May 10, 2017: Author Registration Deadline

Aug. 21-25, 2017: ICED 2017

Conference theme for special sessions and keynotes:

“Resource-Sensitive Design”. This general theme encompasses three main areas. The first is “Design to advance resource-limited societies”, or how to design products that succeed given limited infrastructure, uncertain supply chains and cultural factors that impact product introduction. Second, Design to protect critical resources: especially in British Columbia, how do limits on critical natural resources such as oil, gas, water, and forestry define how products are designed and fabricated? And third, Design to embrace resource limitations, or, how can all of us learn to design with a minimalistic approach: elegant, functional design through simplicity.

Activities and Events

Plenary, podium and discussion sessions

Keynotes from academia and industry

Workshop sessions

Industry exhibits

Design Society meeting

Young Members event

PhD forum

Technical tours in evenings or on the last day of the conference to local companies, partner universities and other venues

Social events such as conference dinners, and also additional excursions that participants will book separately

Newsletter

ISBE Newsletter

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Published by the International Society of Bionic Engineering (ISBE)



ISBE Newsletter

Volume 5, Issue 1, 2016



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