



International Society of Bionic Engineering

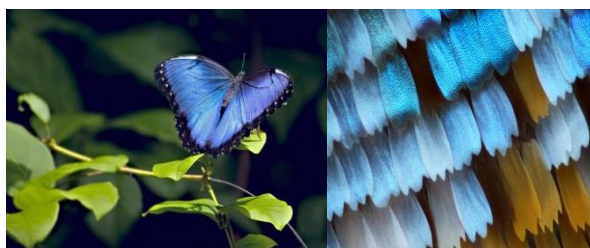
NEWSLETTER

Vol.2 Issue 2 December, 2013



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ISBE is an educational, non-profit, non-political organization formed in 2010 to foster the exchange of information on bionic engineering research, development and application.

Our Mission:

The society is dedicated to the advancement of communication and cooperation among all scholars, and the furtherance of knowledge and education in the field of bionic engineering.

Membership

ISBE Membership

ISBE is made up of 516 Individual Members and 20 Corporate Members. Our members come from over 39 different countries and 6 continents. ISBE membership is open to those who have manifested a continuous interest in any discipline important to bionic engineering research as evidenced by work in the field, original contributions and attendance at meetings concerning bionic engineering research.

Min Jun Kim (South Korea)

Drexel University-USA

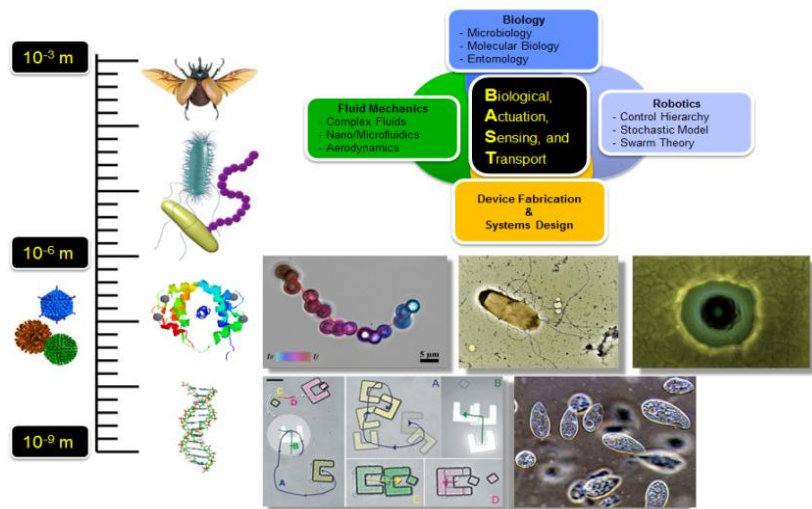
Dr. Min Jun Kim is presently an associate professor at Drexel University with a joint appointment in both the Department of Mechanical Engineering & Mechanics and the School of Biomedical Engineering, Science & Health System. He received his B.S. and M.S. degrees in Mechanical Engineering from Yonsei University in Korea and Texas A&M University, respectively. Dr. Kim completed his Ph.D. degree in Engineering at Brown University, where he held the prestigious Simon Ostrach Fellowship. Following his graduate studies,



Dr. Kim was a postdoctoral research fellow at the Rowland Institute in Harvard University. Dr. Kim's notable awards include the National Science Foundation CAREER Award (2008), Louis & Bessie Stein Fellowship (2008), Drexel Career Development Award (2008), Human Frontier Science Program Young Investigator Award (2009), Army Research Office Young Investigator Award (2010), Alexander von Humboldt Fellowship (2011), KOFST Brain Pool Fellowship (2013), and Bionic Engineering Outstanding Achievement Award (2013).

For the past several years, Dr. Kim has been investigating the biological and physical phenomena in the small world including cellular/biomolecular mechanics and engineering in order to open new frontiers in microrobotics.

Biological Actuation, Sensing, & Transport Laboratory



Microrobotics have many

recent intense developments due to the possibilities for many applications including in micromanipulation and microfabrication, drug delivery, and minimally invasive surgery. The unique approach to wirelessly control micro- and nanorobots in microscopic spaces not accessible using conventionally methods will allow us to improve upon existing technologies by breaking current technical limitations. Difficulties in developing effective propulsive systems have limited developments due to low Reynolds number dynamics in viscous and viscoelastic fluids. To overcome such challenges, we work at the interface between microbiology and robotics to create three categories of microrobots: biologically inspired propulsive microswimmers, bacterial-powered hybrid microbiorobots, and magnetotactic cellular microrobots. Inspired by examples in nature, these microscale robots have demonstrated low Reynolds number navigation, microscale assembly, and autonomous control. Currently, Dr. Kim aims to answer some of the fundamental scientific questions by reexamining the geometrical requirements for micro- and nanopropulsion, thereby, redefining the traditional notions used to design micro- and nanoswimmers. Furthermore, he aims to advance the applications of microrobotics to the realm of non-Newtonian swimming and swarm control.

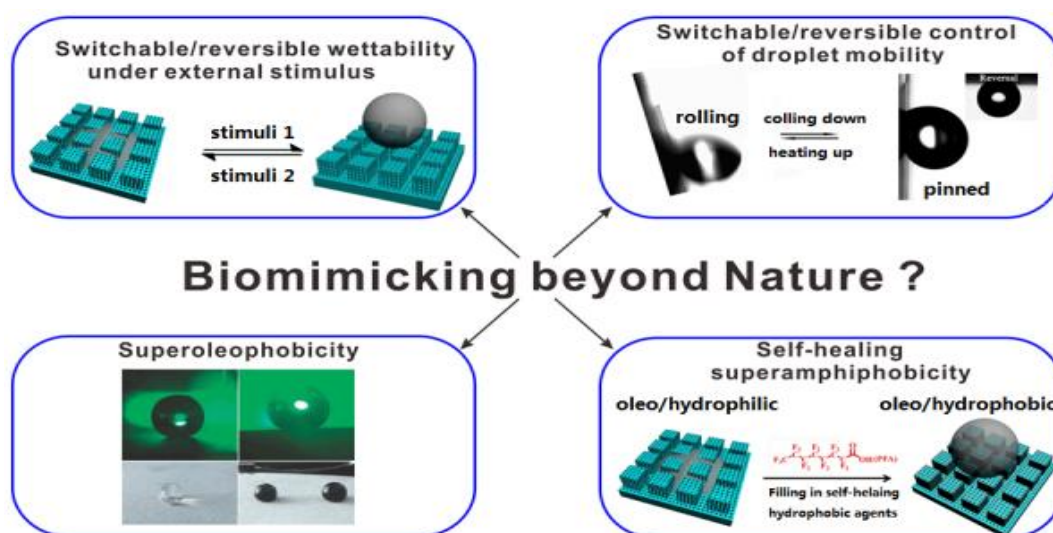
Feng ZHOU (China)

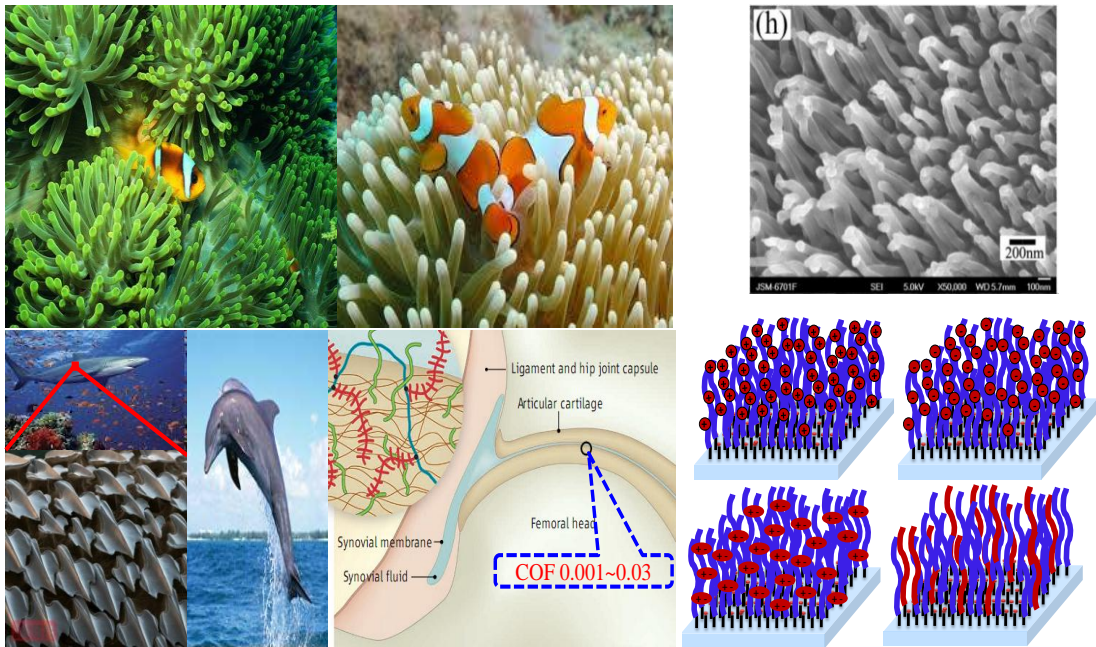
Lanzhou Institute of Chemical Physics



Dr. Feng ZHOU is a full Professor in Lanzhou Institute of Chemical Physics, CAS and Deputy director of State Key Laboratory of Solid Lubrication. He gained PhD in 2004 and spent three years (2005-2008) in the Department of Chemistry, University of Cambridge as a research associate. He has published more than 160 journal papers that received more than 3600 citations and has the H-index 35. His research interests include the biomimic surfaces/interfaces of soft

matters, functional coatings with extreme wetting and tunable adhesion, engineering coatings for oil seal, drag-reduction and antibiofouling, and biolubrication. His review paper "Extreme wettability and tunable adhesion: biomimicking beyond nature?" published on Soft Matter (2012, 8, 2070-2086) most representatively reflects his research goal: by "learning from nature and doing better than nature". He is not only focusing on fundamental research but also developing functional coatings for engineering applications.





He has gained a number of awards including “Young Scholar Award in Tribology”, Chinese Engineering Institute, 2009; “National Young Excellence” Award from National Science Foundation of China, 2011; “Young Scholar Award of Chemistry”, Chinese Chemical Society, 2011 and “Outstanding Youth Award” of International Society of Bionic Engineering, 2013.

ISBE Membership

ISBE membership is currently free and open to any individual or organization with an interest in Bionic Engineering.

Join ISBE, you can obtain more opportunities !

ISBE Members are leaders of Bionic Engineering!

ISBE Members recommend good papers to JBE!

ISBE Members receive the Transactions and Newsletter!

ISBE Members have discounts at the ICBE!

More Information about ISBE membership, please visit:

<http://isbe-online.org/membership.asp>

News and Events

BIONIC ENGINEERING AWARDS 2013

Bionic Engineering Award is set up by ISBE to honor and encourage excellent members who make great progress in bionic engineering field, and to further promote the development of bionic discipline.

In making the final judgment the Adjudicators considered the following attributes: Ability to work in an interdisciplinary environment: skills in biological sciences and in engineering must be evident (both categories in their broadest sense); other sciences (e.g. computing, mathematical modeling, environmental science, etc.); number and range of disciplines of collaborators; range of topics of journals in which the candidate has published.

AWARD SOURCE



Bionic Engineering Award in 2013 is 50,000 RMB donated by Prof. Luquan REN, the Member of the Chinese Academy of Sciences (CAS) and Standing Vice President of ISBE. The award is sponsored by the members of ISBE voluntarily to reward the members who make outstanding contributions to bionic engineering research. It is presented at the International Conference of Bionic Engineering held every three years.

Congratulations to the WINNERS!



Prof. Min Jun Kim
Outstanding Contribution Award



Prof. Feng ZHOU
Outstanding Youth Award

ICBE'13 a Success

The 4th International Conference of Bionic Engineering (ICBE'13) was held in Nanjing, P. R. China on August 14-16, 2013. The conference was organized by the International Society of Bionic Engineering (ISBE) and sponsored by Nanjing University of Aeronautics and Astronautics (NUAA), Jilin University, National Natural Science Foundation, Ministry of Science and Technology, and Research Institute of Petroleum Exploration & Development, whose representatives attended the opening ceremony and addressed. Prof. Luquan REN, the donator of Bionic Engineering Award in 2013, delivered important speech at the conference. ICBE'13 intends to bring together researchers and scholars in the academic field from around the world to share their research experience and explore research collaboration in the fields of bionic engineering.



In addition, nearly 300 representatives from 20 countries attended the conference, respectively from Britain, America, Canada, Australia, Austria, Japan, South Korea and China among others. The representatives showed their latest academic achievements on bionic engineering and exchanged their points of view on several topics such as biomimetic surface, biomimetic materials, biomechanics, robotics, motion systems, and artificial intelligence.

The First Bionic Engineering Award Ceremony was held at the opening ceremony of the conference as well. Prof. MinJun Kim from Drexel University (US) and Prof. Feng ZHOU



from Lanzhou Institute of Chemical Physics (China) got the Outstanding Contribution Award and Outstanding Youth Award respectively. The meeting of the Executive Board of Directors of ISBE and the meeting of the 10th Anniversary of the Journal of Bionic Engineering (JBE) were also held during the conference.

The great success of ICBE'13 not only expressed the current research achievements on Bionic Engineering but also offered a platform for representatives to communicate and cooperate with each other. It will greatly push forward the development of bionic engineering worldwide.

AWARDS PRESENTED IN ICBE'13

☞ Excellent Oral Presentation Award

- 1) David Vokoun *"Functionality of Superelastic NiTi Velcro-Like Fasteners"*
- 2) Keju Ji *"Study on the Tribological Behavior of the Foamed Copper Filled with Epoxy Matrix"*
- 3) Lei Wang *"Aerial Ballet in Emei Tree Frog: Could frogs turn over during falling in supine posture"*

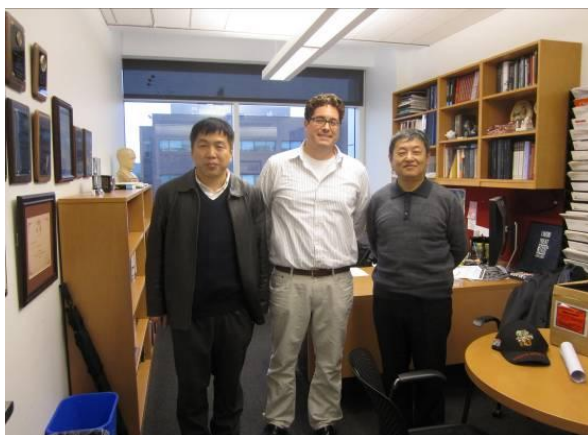
☞ Excellent Poster Presentation Award

- 1) Dapeng Wang *"Bio-Inspired Microhair Arrays for Superhydrophobicity and Unidirectional Wettability"*
- 2) Jinbo Zhang *"Simulation of Bionic Anti-drag Subsoiler with Exponential Curve Feature Using Discrete Element Method"*
- 3) Hao Wang *"The mechanism of air-righting performance in tree frogs"*



The General Secretary of ISBE visited Cornell University, US

On November 17-23, Prof. LI Jianqiao, the General Secretary of ISBE and Prof. MA Yunhai from Jilin University, P. R. China visited Ithaca Campus and New York Campus of Cornell University. Prof. Michael R. King, the vice president of ISBE, met them at Cornell University.



During the meeting, the two sides talked about the development of ISBE, international cooperation programs among others. They will encourage teachers, postdoctoral fellows, and postgraduates to develop research programs together. The two sides also reached consensus on applying for cooperate programs based on the research of biomimetic materials, biomaterial, and bionic engineering technology.

Cornell University is an American private Ivy League research university located in Ithaca, New York, United States. The university was intended to teach and make contributions in all fields of knowledge – from the classics to the sciences, and from the theoretical to the applied.

Academics

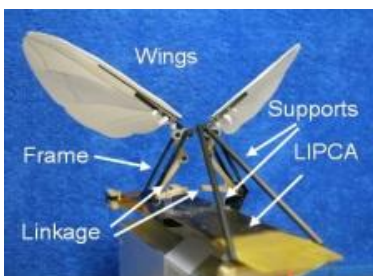
Research on Insect-mimicking Flapping-wing Micro Air Vehicle in Konkuk University, South Korea

Micro Air Vehicle (MAV) is defined as a palm-size flyer. Konkuk University (KU) in Seoul, South Korea has been developing various types of MAVs since 2000. Recently, Prof. Hoon Cheol Park's research team has successfully demonstrated unconstrained and uncontrolled vertical takeoff of an insect-mimicking flapping-wing (FW) MAV. Since the flyer does not possess any mean of control, it must be inherently stable at the early stage of take off.

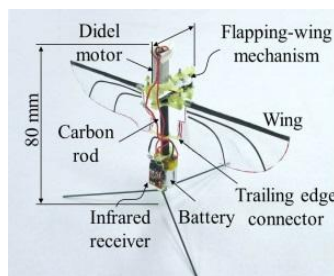


At the early stage of Professor Park's research on FW-MAV, they developed an insect-mimicking flapping-wing system actuated by LIPCA (Lightweight Piezo-Composite Actuator). The system could mimic some key features of insect flight such as flapping motion, wing rotation, clap-fling, and wake capture mechanism in insect flight.

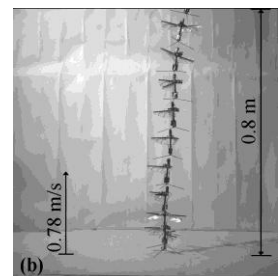
Recently, they have developed motor-driven FW-MAVs to mimic insect flight. The wing span of the FW-MAV is only about 12cm. The total weight of the FW-MAV (including battery and infrared receiver) is about 7.1 gf. The wings are made of carbon fiber and propylene membrane. With special design of wing and flapping mechanism, the FW-MAV could achieve a similar wing kinematics of a real beetle, which produces flapping angle of 160° and wing twist from the wing root to the wing tip. The FW-MAV could demonstrate uncontrolled, unconstrained free flight with onboard battery and infrared receiver at a speed of 0.78 m/s.



LIPCA-driven FW-system

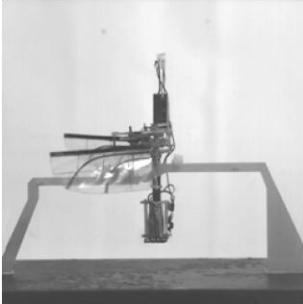


Motor-driven FW-MAV

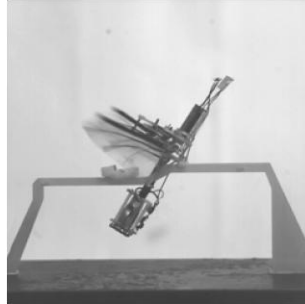


Uncontrolled takeoff

More recently, they successfully designed and implemented the pitch moment generation mechanism into the FW-MAV. The mechanism is under more study to use it for longitudinal attitude control of the FW-MAV.



Normal posture

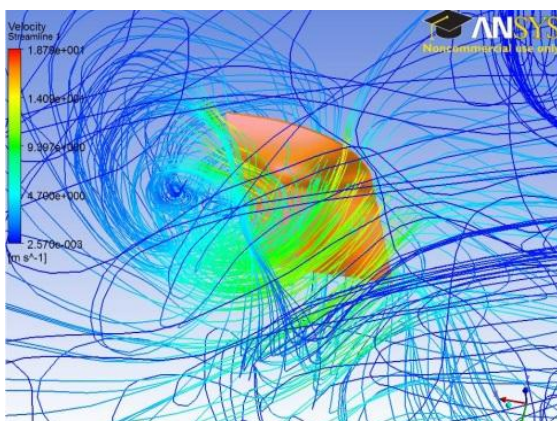


Pitch-up

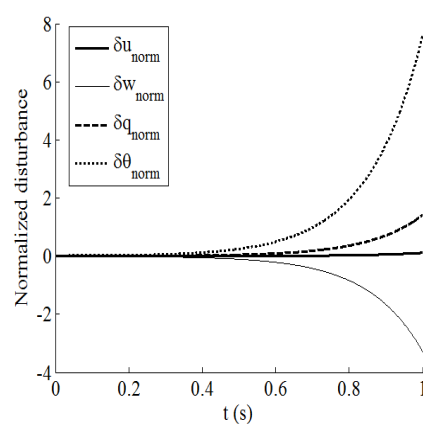


Pitch-down

Along with the mechanical design and experimental test, they also built a MATLAB code based on unsteady blade element momentum theory (UBET) to estimate the forces and moments generated by the FW-MAV. Beside the UBET program, they used ANSYS-Fluent® to estimate the forces, moments, and flow field generated by the FW-MAV. Based on the CFD calculation results, they could conduct eigenvalue analyses to judge the longitudinal dynamic stability of the FW-MAV. The stability analysis showed that the FW-MAV could stably take off for the first 0.5 second for small disturbances, even without attitude control.



Flow field around wing



Response of the FW-MAV

Hemi-pelvic Reconstruction: Design in a Biomimetic Way

by Hua Zikai, China

The pelvis is a major structure within the human body, which forms the upper part of the hip, and therefore plays an important role in the load transfer across this joint (Fig.1). However, the pelvis can become damaged due to accidents and pelvic bone tumors. Hence, in orthopedic surgery, pelvic resection is proposed. After partial pelvic resection, it is essential to reconstruct the pelvic ring and acetabulum so as to reestablish continuity between the lower extremity and the axial skeleton, thus obtain functional recovery. Currently, pelvic resection and reconstruction is still a particular challenge, especially in regard to the appropriate pelvic prosthesis design.

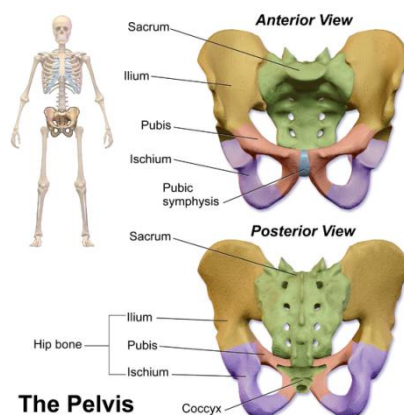


Figure 1 Structure of pelvis

Note: http://en.wikipedia.org/wiki/File:Blausen_0723_Pelvis.png

Dr. Zikai Hua and his group in Shanghai University, cooperating with local orthopedic implants manufacturer, Shanghai Thytec, now are focusing on developing new biomimetic hemi-pelvic prostheses for pelvic reconstruction. In their opinions, hemipelvic prostheses need to be biomimetically designed, so as to provide a reliable and better performance to the patients.

Fig.2 shows an illustration of one of the prostheses they are developing, which contains ilium, acetabulum and pubis. These modular parts are the major bones in natural human pelvis. Comparing with the previous types of hemi-pelvic prostheses, the structure of the biomimetic hemipelvic prosthesis is more similar to the nature pelvis. In their recent simulation results, they found that using this biomimetic hemipelvic prosthesis, the

biomechanical function of the pelvic ring can be reestablished. No significant difference in the load transferring routine is observed between the reconstructed and original pelvis in standing motion (Fig.3).

Some of the prostheses have already been implanted. But, Dr. Hua said 'It is just a beginning, still long way to go in the future. And we need to understand the fundamental behavior of pelvis, i.e. pelvis may release and transfer force through the deformation of itself. However, due to the discontinuity of the material properties, deformation can not be well transferred, consequently instability and stress concentration will be induced. How to overcome such kind of problems still requires further study to understand the natural performance of human pelvis. Biomimetic is the concept we would like to implant in the very beginning of our works, which can help us to have an overall thinking of what kind of prostheses we would like to develop and how it will support the surgery.

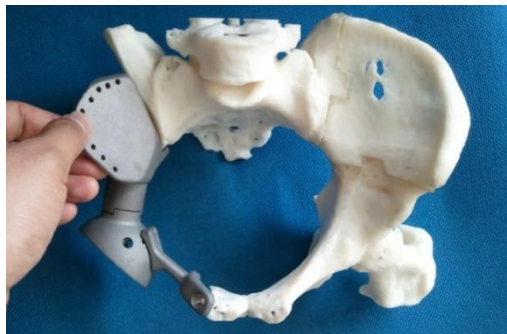


Figure 2 Illustration of biomimetic hemi-pelvic prostheses

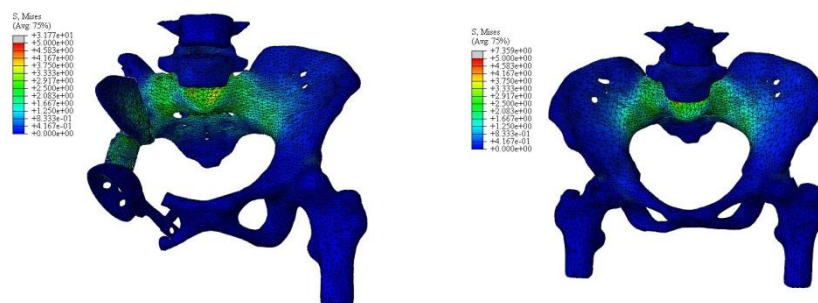


Figure 3 Stresses in the reconstructed pelvis (left) & original pelvis (right)

The research is undertaken by Dr. Zikai Hua, School of Mechatronic Engineering & Automation, Shanghai University, and Shanghai Thytec Co. Ltd., and will be published in Journal of Bionic Engineering.

Cassino Larm Hand – Technical Specifications

by Marco Ceccarelli, Italy



The LARM Hand is composed of three fingers whose design is aimed for an anthropomorphic behaviour. In particular, a human-like grasping is obtained by each finger with 1 d.o.f. (degree of freedom) motion by using a suitable mechanism whose design has been obtained through cross four-bar linkages to be fitted in the finger body. The design compactness is useful to achieve a suitable stiffness at grasp too. The current low-cost solution can be completed with force sensors on phalanx surfaces and

palm area that have been designed with a suitable surface configurations. Consequently the grasp can be regulated through a simple control using those force sensor signals and an industrial small PLC for an easy programming. The LARM Hand can be used as a grasping end-effector in robots and automatic systems, and even it has a potential feasibility as biomechanical prosthesis, once suitable adjustments are made.

Low-cost easy-operation three-finger Cassino LARM Hand

General characteristics

- Total fingers: 3
- Joints per finger: 3
- Actuator per finger: 1
- Total hand actuators: 3

Range of Motion

- Finger input joint: 40 deg
- Fingertip link: 140 deg

Finger Speed

- Finger fully open to fully closed: 2.0 sec

Force Sensing

- Sensors on palm: 1
- Sensor type: force sensing resistor
- Force sensitivity: 1 to 100 N
- Force resolution: >0.5% full scale
- Lifetime: >10 million actuations

Motor Type

- 24V permanent magnet DC motors

Power Supply

- Typical 15V DC power supply
- Max required power: 300 W

Control System & Software

- Mini PLC Logo
- Siemens Logosoft Comfort

Dimensions

- Finger: 1:1 human finger size
- Hand: 110x240x120 mm

Size of Grasped objects

- 10-100 mm

Weight

- Hand: 15 N
- Payload: 5 N

Robot Arm Adapter

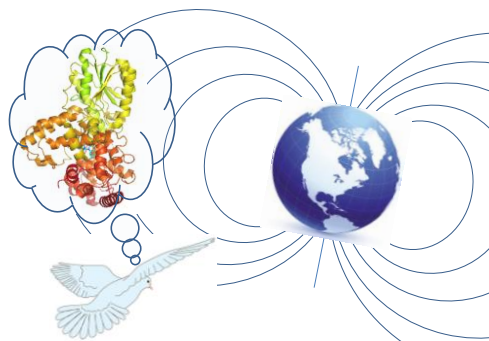
- The hand can be connected to standard flanges of robots

Bionic Researches of Prof. WU Wenjian's Group in National University of Defense Technology

After 10 years' bionic research experience in chemistry and materials, Prof. WU, the head of Department of Chemistry and Biology in the



University of Defense Technology, proposed the new concept of bionic biology in 2009, aiming to focus on biological mechanism and simulation of the life vitality in the process of bionic researches. WU's group is interested in bionic sensing and navigation, bionic materials and structure, and synthetic biology.



WU's group cloned and expressed a new member of geomagnetic sensitive protein from pigeon, *C/Cry*, and successfully designed and synthesized a ternary compound based on biological mechanism and structure of the protein. Moreover, it is

exciting that both the protein and the artificial molecule are verified to respond distinctively to the applied earth-strength magnetic field about 50~300 μ T.

By cloning receptor's genes of Or83b, Or7a and Or42 from fruit fly, and expression in xenopus oocytes, WU's group tries to construct an odorant sensor, which will work as similar as a natural nose, and will be sensitive to explosive vapor. This study will promote the development and application of novel bionic odorant sensors.

In the group, bionic composite materials inspired by plant leaves exhibit very similar reflectance spectra with those of green vegetation leaves. Conductive hybrid films composed of gold nanoparticles and cellulose are also promising to be used as both supporting substrates and electrodes of biomembranes. Structures of mineral bridges like those in nacre are also obtained for the first time in the bionic growth process of calcium carbonate.

Based on the previous research on antifouling coatings which combine the effect of lower surface energy and bio-inspired surface microstructures, WU's group tries to

integrate more bionic antifouling elements. The Bacp-19k gene from *Balanus albicostatus* has been cloned and expressed. Future studies will be focused on relationships between specific structures and functions for the molecular design of antifouling inhibitors, and matching it into substrate coatings.

The Model for the Rules of Knowledge Life Forms

Liu Fu-lin, Li Shu-ping, Song Wei-yi, Kang Jie, Liu Dan, China

“The Model for the Rules of Knowledge Life Forms” is the latest research achievement in the field of bionic knowledge accomplished by Fulin LIU *et al.*, who are members of international bionics engineering society and professors of department of life science in Shangqiu Normal University. The paper was published in *Studies in science of science* in 2012 tenth period.

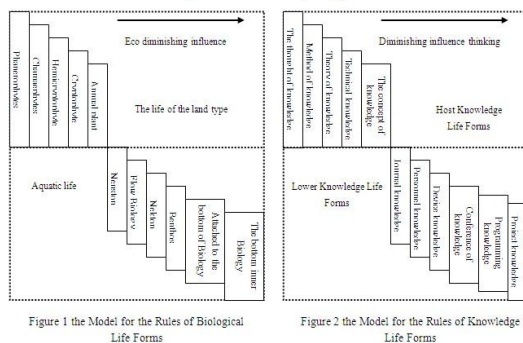


Figure 1 the Model for the Rules of Biological Life Forms

Figure 2 the Model for the Rules of Knowledge Life Forms

This research proposed the models of knowledge life forms through cross-domain mapping applying the rules of biological life forms as prototypes, based on the thoughts of knowledge DNA's cross-domain mapping and through the adoption of such research methods as bionic deduction and

corroborative research. Such models included influences of thoughts, the concept, types, rules and models of knowledge life forms. After testifying real cases, the models of such rules revealed the rules for knowledge's existence forms within knowledge communities and proposed the prospects of such rules applications into such aspects as knowledge innovation and knowledge management. Then, such models proposed the prospects of such rules applications into such aspects as knowledge community, knowledge mining, knowledge visualization and knowledge transformation, and also suggested a brand-new research topic of reclusive knowledge visualization. Such results represent important basic theories based on bionics findings, and can be applied into such relevant research domains as knowledge innovation and knowledge management, thus bearing prominent scientific significances and application values.

Upcoming Activities

Symposium on Agricultural Bionic Engineering & Technology

To further promote the research and development of agricultural bionic engineering, the **Symposium on Agricultural Bionic Engineering & Technology** co-sponsored by the International Society of Bionic Engineering and International Commission of Agricultural and Biosystems Engineering will be held in mid-September of 2014 in Beijing, Detailed information is as followed:

THEME: Agricultural Bionic Mechanism Design and Manufacturing

DATE: September 16-19, 2014

VENUE: China National Convention Center (CNCC), Beijing, China

IMPORTANT DATES:

Abstract submission deadline Mar. 1st, 2014

Notification of abstract acceptance Apr. 15th, 2014

Early bird registration May 31st, 2014

Full paper submission Jun. 1st, 2014

Information to authors on website Jul. 1st, 2014

Hotel reservation and tour deposits Aug. 1st, 2014

Detailed registration information please refer to the

website <http://www.cigr2014.org/EN/column/item91.shtml>

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Web: http://isbe-online.org/news_nr.asp?actionid=72

Bio-inspired Technologies Towards H2020

The workshop will bring together leading UK and Swiss researchers and industry players applying biomimetic principles to solve a wide range of issues. It will help address how EU funding can support research and innovation efforts, focusing on opportunities to collaborate on H2020 calls.

Date: January 21-22, 2014

Venue: University of Cambridge, Silver Street, Cambridge, CB3 9EP, UK

The event is organized by Cambridge University 4CMR, the UK Science & Innovation Network in Switzerland and the Swiss Embassy in the UK.

Participation to the workshop is free, but by invitation only.



Welcome to 2014 ICN / JSCP B in Sapporo, Japan

Key dates
Registration and abstract submission
will open January 2014.

2014 ICN / JSCP B is a joint meeting of the 11th International Congress of Neuroethology (ICN) and the 36th Annual Meeting of the Japanese Society for Comparative Physiology and Biochemistry (JSCP B). The conference will be held at the Sapporo Convention Center, Sapporo, Japan, July 28th through August 1st, and is co-organized by the International Society for Neuroethology (ISN), the Japanese Association of Neuroethologists (JAN) and the Science Council of Japan (SCJ).

The conference attracts scientists and students engaging in neuroethology – the study of neural mechanisms of animal behavior – working in a broad range of disciplines, including neurophysiology/ neuroanatomy, molecular biology/genetics, cognitive psychology, computational neuroscience, and robotics. Neuronal mechanisms of any species – invertebrate or vertebrate, including humans – will be subjects of discussion.

A major goal of the conference is to promote discussion and collaboration among neuroethologists in Asian countries. We particularly welcome participation of Asian researchers at all levels.

International Workshop, 28-29 April 2014, University of Nottingham, Nottingham, UK
“Biomimetic Approaches of Natural Functional Surfaces with hierarchical micro & nano structure and the extreme Wettability”

Sponsored by European FP7 Marie Curie Actions International Research Staff Exchange Scheme, PIRSES-GA-2011-295224 (BioApproNFSWett)

Registration: 17.30-20.30 on 28th April; Workshop presentations 9.00 - 17.00 on 29th April

Attendants / Speakers:

der Deutschen Institute für Textil- und Faserforschung Denkendorf, Germany Instituto Superior Técnico, Portugal Jilin University, China Liverpool John Moores University, UK, Hertfordshire University, UK University of Nottingham, UK

Additional speakers are invited; please contact Professor Yuying Yan before end of February 2014 at yuying.yan@nottingham.ac.uk; Tel: +44 115 951 3168

International Heat Transfer Symposium

Date: 6-9 May 2014 **Venue:** Beijing, China

Special topics:

Micro/nano scale heat transfer: Targeted for the performance improvement of high power density energy saving devices/systems such as light-emitting diodes (LED) and other miniaturized systems, subtopics include single-phase, multi-phase (boiling and condensation) heat transfer in micro/nano scale, radiation heat transfer in micro/nano scale, fundamental micro/nano scale heat transfer, novel heat transfer devices, experiments and numerical simulations of micro/nano flow and heat transfer, **nature-induced heat transfer phenomena and applications**, etc.

Heat transfer in energy and power systems

Heat transfer in renewable energy utilizations

Sponsors:

National Natural Science Foundation of China

The Royal Society of United Kingdom

Ministry of Science and Technology of the People's Republic of China

Ministry of Education of the People's Republic of China

More Details, please visit <http://www.cuhts.org>.





ROMANSY-2014

XX CISM-IFTToMM SYMPOSIUM on Theory and Practice of Robots and Manipulators Moscow: 23-26 June 2014

The First Symposium was held on Sept. 5–8, 1973, in Udine and this is the 20th edition. RoManSy2014 will continue this tradition, with the aim to bring together researchers, industry professionals and students from the broad ranges of disciplines referring to Robotics, in an intimate, collegial and stimulating environment.

The Symposium will be held at the Institute of Mechanical Science of RAS in Moscow.

Topics

Papers are solicited on topics related with robots within aspects of theory, design, practice and applications, including but not limited to: novel robot designs and robot components;

service robots and humanoid robots;

bio-robotics, micro and nano-robots;

kinematics and dynamics of robotic systems;

grasping, handling and intelligent manipulation

sensor systems for robots;

vision and control systems for robots;

robot prototyping, experimental robotics.

Supported by

IFTToMM, International Federation for the Promotion of Mechanism and Machine Science

Institute of Machines Science - RAS in Moscow

University of Cassino and South Latium

IFTToMM Member Organization of Russia

For more information. Please visit <http://romansy2014.bmstu.ru/index.php/en/>

CALL FOR SPONSORSHIP

The International Conference of Bionic Engineering(ICBE) and International Workshop of Bionic Engineering(IWBE) are premier meetings for those working on bionic engineering. They bring together researchers and developers, both academic and industrial, from around the world to share their research achievements and explore research collaborations in the fields of bionic engineering.

Sponsoring the ICBE or IWBE is an excellent way to communicate with hundreds of international researchers and exhibit to a wide range of institutions and universities from all over the world. All the members of the society have the right to apply for the sponsorship. Sponsors are requested to submit their applications to the secretariat, stating the information and assumption of your sponsorship.

All offers of sponsorship will be considered on their merits. The Board of Directors of the ISBE reserve the right to receive offers, judge the value of offers, request further information and make the decision.

If you are interested in becoming a sponsor for ICBE or IWBE, please contact us by any of the means listed below.

ISBE Secretariat

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E-mail: office-isbe@263.net; jlu_isbe@hotmail.com

Official website: <http://www.isbe-online.org/>

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