INTERNATIONAL FEDERATION FOR MEDICAL AND BIOLOGICAL ENGINEERING

Affiliated with the International Union for Physical and Engineering Sciences in Medicine (IUPESM)

www.ifmbe.org

IFMBE : An Overview
IFMBE : Et Overblikk

SHANKAR KRISHNAN, PH.D.
FELLOW, AIMBE; LIFE SENIOR M, IEEE
PRESIDENT, IFMBE
PROFESSOR & CHAIR, WIT, BOSTON
Shankar Krishnan, Ph.D., President, IFMBE  
Fellow, IFMBE, Life Senior Member, IEEE-EMBS  
Professor & Chair, WIT, Boston, USA

- **Academic Experience**
  - Founding Chair, Biomedical Engineering Department, WIT, Boston, USA
  - Founding Chair, Bioengineering Division, NTU, Singapore
  - Founding Director, Biomedical Engineering Research Center, NTU, Singapore
  - Founding Coordinator, Biomedical Instrumentation Program, SIU, Illinois, USA

- **Industry Experience**
  - Bechtel Corporation, SF, USA: Medical Systems Specialist
  - Royal Commission Hospital, Admn Board member, Tech Ops Mgmt, Jubail, KSA
  - Coulter Electronics, Miami, USA, Research and Development, Lab equipment

- **Hospital Experience**
  - Mass General Hospital, Harvard University Medical School, Boston, MA
  - Singapore General Hospital, Co-director, NTU-SGH Collaboration
  - Consultant: FujiInon (Endoscopy), HP (Patient Data); ITC (AI-Image processing)
I am pleased and honored to participate in this exciting conference organized by Medisinsk Teknologisk Forening.

The coverage of this conference includes many interesting, informative, educational, thought-provoking and most importantly very relevant topics to the attendees at this conference.
Hilsner, Damer og Herrer

IFMBE : Et Overblikk
The mission of IFMBE is to encourage, support, represent and unify the world-wide Medical and Biological Engineering community in order to promote health and quality of life through advancement of research, development, application and management of technology.
Affiliated Members of IFMBE

Since 1959

International Federation for Medical and Biological Engineering

Affiliated with the International Union for Physical Engineering in Medicine (IUPEDM)

www.ifmbe.org

Affiliated Transnational Organisations:

• ACCE
• AAMI
• CAHTMA
• CORAL
• EAMBES
• IEEE/EMBS
IFMBE : Goals

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To advance collaboration between national and transnational societies, industry, government and non-government organizations engaged in health care and in biomedical research and its applications.

To recommend policies and provide guidelines in appropriate professional, educational and ethical areas.

To enable IFMBE to achieve its goals effectively, optimize the organizational structure and communication and enhance its finances.
IFMBE’s Liaisons

International Science Council (ISC)

- IUPESM: International Union for Physical and Engineering Sciences in Medicine
- IFMBE: International Federation for Medical and Biological Engineering
- IOMP: International Organization for Medical Physics

Scientific Unions (39)
Scientific Members (mainly Academies of Science, 141)
IFMBE’s Liaisons to UN & WHO

UN

WHO

UNESCO

UNIDO

ISU

World Alliance for Patient Safety

E-health Initiative

UNESCO

IFMBE

IOMP

IUPESM

Standardization

ISO

IEC

CEN

CENELEC
IFMBE Awards

- Otto Schmidt Award (Exceptional Contributions to the Advancement)
- Vladimir Zworykin Award (Outstanding Research Contributions)
- IUPESM Award of Merit (Distinguished Career)
- John Hopps Award (Distinguished Service)
- Laura Bassi Award (Outstanding Female Researcher)
- James Zimmerman Prize (Outstanding Researcher BIOMAG)
- IFMBE-IAMBE Early Career Award
- IFMBE-WHO Innovative HealthTech Award (Outstanding CE)

The Deadline for the nominations for the Awards is September, 15, 2020. The Awards will be presented to winners in WC2021 in Singapore.
Benefits for Individual members of IFMBE

Who are individual members of IFMBE?

- Every member of an IFMBE affiliated BME society; e.g. Swedish BME Society, Mexican MBE Society, Croatian BME Society, IEEE EMBS and more than 50 other societies

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- What are the benefits of individual members?
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- **FREE** access to IFMBE News
- Discount on other selected BME Journals published by Springer
- Discount on BME books published by Springer
- Discount on registration fees at IFMBE sponsored and co-sponsored conferences
IFMBE sponsored and co-sponsored Conferences

Int’l Conference on Biomedical and Health Informatics ICBHI 2019, Taipei, Taiwan, April 17-20, 2019
https://www.icbhi2019.com/

XV MEDICON 2019, Coimbra, Portugal, September 26-28, 2019

CLAIB 2019- Cancun, Mexico, 2 – 5 October 2019
IFMBE sponsored and co-sponsored Conferences

11th Asia Pacific Conference on Medical and Biological Engineering - APCBME 2020, May 25th-27th, 2020, Okayama, Japan

18th Nordic Baltic Conference NBC 2019, Reykjavik, Iceland, 2019

European IFMBE BME Conference 2020, Portorož, Slovenia, June 14-18, 2020
IUPESM World Congress on Medical Physics and Biomedical Engineering 2021
Sands Expo and Convention Centre, Marina Bay Sands, Singapore
30 May – 4 June 2021

IUPESM World Congress on Medical Physics and Biomedical Engineering, Singapore, May 30 – July 4, 2021  
https://bes.org.sg/wc2021
Take Home Message

- Join IFMBE
  - Increase membership
  - Enhance activities
  - Conferences, workshops, symposia
  - Huge networking
- We are biomedical engineers from academia (hospitals, medical device industry, government, and banks)
- Our mission is the same: We want to improve the quality of human life
- Let us collaborate together, contribute together, reap the benefits together, and serve humanity together
- Jointly, all of us will serve humanity!
New Hospital Facilities: Medical Equipment and Systems

- New Hospitals Design, Selection, Construction, Installation
- Construction, Installation
- Testing, Commissioning, Acceptance Testing, Failure mode Testing
- Training, Documentation, MEMS Data Base, Procedures
- Accreditation Requirements, CAPA Procedures
- Periodic Inspection, Periodic Training
- Simulated Inspections
- Equipment changes, failures, updates and configuration control
- Weekly Review of Calls and Actions
- UPMC 2b$ new facilities, B3C at MGH
New Hospital Facilities: Medical Equipment and Systems

- Close collaboration with IT Department and Nursing (End users)
- Medical Device Networks, Data closets, wireless and wired connectivity
- EHR and Medical Data Integration
- Patient Data Privacy, Security
- Cybersecurity, Teams for Preparedness, Diagnosis and Actions
- Responsibilities Defined, Team members, Periodic review of Actions
- Cyberthreats, Hacking in Healthcare alarming high percentage
New Hospital Facilities: Medical Equipment and Systems

- Small Hospitals: similar approaches
- Coordination with secondary and Tertiary Care
- Patient Medical Information transportability
- Information on Patient implants and related data

- Emergency Care, Day Care, Urgent Care modalities

- Continuum of Care
- Home Health care modalities
- Patient engagement, Care taker training and engagement
- Connectivity of patient data devices to internet
- Center of Connected Health, Partners Organization in Boston
Emerging Topics of Interest to Biomedical/Clinical Engineers

- Artificial Intelligence in Medicine
- Big Data and Healthcare Analytics
- E health, m Health, p health
- 3D Rapid Prototyping, Additive Printing
- Wearables
- Minimally Invasive surgery, Image guided surgery
- Transcatheter Aortic Valve Repair, TAVR, TMVR
- Robots in Medicine
- Patient-centric Models for Diagnosis and Treatment
- Genetic information, Biomarkers, Systems Biology, Precision Medicine
- P4 paradigm: Predictive, Preventive, Personalized and Participatory
12 Trends that will dominate Health Informatics
1. Using HIT to enhance patient engagement & experience

Healthcare organizations will invest in care delivery models (such as mobile apps) as patients want more control over their data and the ability to easily share it.

2. Rising efforts to achieve digital health

New uses for existing and emerging technologies will give consumers and providers more options for delivering care.
3. **Accelerating use of AI & data visualization**

The most substantial AI applications will be in image processing through early stage machine learning for areas like radiology and dermatological lesions.

4. **Rising importance of population health management**

A variety of information technologies will be used to segment populations and treat their specific illnesses in order to optimize outcomes and cost.
5. Growing efforts by payers to provide total care management

Companies are attracting investment because they’re seeking to offer a better user experience, and collect/utilize data in ways that will drive optimal outcomes.

6. Pressing towards interoperability

Patient demand for data sharing and improved interoperability will have the added side-effect of propelling industry-wide momentum toward value-based care.
7. **Pushing to EHR optimization**

New platforms and infrastructure innovations will be made to allow hospitals to finally get a handle on messy, unstructured data in order to take advantage of new AI advances.

8. **Protecting health information & data security**

As providers face increased pressure from hackers and intrusion, they are ramping up security efforts and spending, especially on technologies such as encryption, deception detection and related consulting services.
9. Rising tide for value-based care

Providers are using new tools and technologies to better manage the health needs of patients under their care, with the intent of minimizing needless spending.

10. Growing role for virtual care

As part of the effort to deliver care in the least expensive, most effective setting, providers will continue to push care to a virtual environment—via telemedicine or in the home, through the use of remote patient monitoring devices.
11. **Increasing influence of the cloud**

Organizations will increasingly see the logic of moving to the cloud to answer their IT needs. As healthcare costs continue to rise, hospitals will struggle to hire and maintain IT.

12. **Wider use of clinical decision support & real-world evidence**

The use of AI, growing sophistication in analytics and growing mounds of care data will increase the prospects for the use of clinical decision support, based on real-world evidence.
I am delighted to participate in this exciting conference in Bergen.

My sincere thanks to the organizers of this Conference.

Meet old friends, make new friends, extend professional network.

We hope you enjoy this conference, create and continue with your collaborative efforts on education, research, new ideas.
Thank You!
Taak skal du ha !!

謝謝
고맙습니다
terima kasih

ありがとうございました
謝謝

ありがとうございました
谢谢

धन्यवाद
Thank You!
Taak skal du ha !!

谢谢
고맙습니다
terima kasih
ありがとう
お世話になりました
谢谢
谢谢
धन्यवाद
IFMBE Meeting with
Board of Medisinsk Teknologisk Forening
Bergen, 25, April, 2019
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International Organization for Medical Physics
IFMBE’s Liaisons to UN & WHO
Journal **MBEC** (Medical and Biological Engineering and Computing)

**IFMBE Proceedings Series** (CD/DVD, Book, On-line)

**IFMBE Book Series**

**IFMBE News**

more info at: [www.springer.com/ifmbe](http://www.springer.com/ifmbe)
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- Discount on BME books published by Springer
- Discount on registration fees at IFMBE sponsored and co-sponsored conferences
IFMBE members have Free Online Access to

- **Medical & Biological Engineering & Computing**
  Editor-in-Chief: J.A.E Spaan
  Impact Factor: 1.757 (2009)
  [http://www.springerlink.com/content/0140-0118](http://www.springerlink.com/content/0140-0118)

- **Biomedical Microdevices**
  Editors-in-Chief: Mauro Ferrari
  Impact Factor: 3.323 (2009)
  [http://www.springerlink.com/content/1387-2176](http://www.springerlink.com/content/1387-2176)

- **Cardiovascular Engineering**
  Editor-in-Chief: John K.-J. Li
  [http://www.springerlink.com/content/1567-8822](http://www.springerlink.com/content/1567-8822)

- **Biomechanics and Modeling in Mechanobiology**
  Editors-in-Chief: G.A. Holzapfel; J.D. Humphrey
  Impact Factor: 3.169 (2009)
  [http://www.springerlink.com/content/1617-7959](http://www.springerlink.com/content/1617-7959)
Health and Technology is the first truly cross-disciplinary journal on issues related to health technologies addressing all professions relating to health, care and health technology.

The journal constitutes an information platform connecting medical technology and informatics with the needs of care, health care professionals and patients.

Thus, medical physicists and biomedical/clinical engineers are encouraged to write articles not only for their colleagues, but directed to all other groups of readers as well.
How to access free IFMBE – Springer publications on Internet?

▶ Individually

▶ You must be a member of an IFMBE affiliated society
▶ You must register for access through your BME Society (name, affiliation, e-mail)
▶ The Secretary General of your BME Society sends a list of registered individual members to IFMBE Secretariat ([ifmbe@fer.hr](mailto:ifmbe@fer.hr))
▶ In return, the IFMBE Secretariat sends every registered member a token
▶ With the token, you open an account at the springerlink ([www.springer.com/ifmbe](http://www.springer.com/ifmbe))
▶ The tokens are reset every 2 years (you must register again every two years)

▶ Through the secure web site of your BME Society affiliated to IFMBE

▶ In case your society has a password protected area, the link to the free IFMBE – Springer can be embedded to the secure web page
▶ Details of technical requests (webmasters!) on the next slide
http-referrer access

Web Requirements

• Protected Member Area (Login)
• Society website URL (e.g. http://www.oegbmt.at/)
• URL to refer from (society website http refer, e.g. http://www.oegbmt.at/drupal/?q=node/336)
• Test Username (for society website)
• Test Password (for society website)

• www.hdmbt.hr
Individual Membership fee for IFMBE

- There is NO membership fee for individuals who are members of affiliated societies.
- The amount of the membership fee that the affiliated BME society pays to IFMBE yearly is symbolic:

<table>
<thead>
<tr>
<th>No. of Members</th>
<th>IFMBE Membership Dues (US$)</th>
</tr>
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<tbody>
<tr>
<td>≤ 31</td>
<td>$2 per member</td>
</tr>
<tr>
<td>32 - 316</td>
<td>$2 per member for first 31 members + $1.75 per member for members in excess of 31.</td>
</tr>
<tr>
<td>317 - 3162</td>
<td>$2 per member for first 31 members + $1.75 per member for next 285 members + $1.25 per member for members in excess of 316.</td>
</tr>
<tr>
<td>≥ 3163</td>
<td>$2 per member for first 31 members + $1.75 per member for next 285 members + $1.25 per member for next 2846 members + $0.50 for members in excess of 3162.</td>
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<thead>
<tr>
<th>Example</th>
<th># Mem.</th>
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<tr>
<td></td>
<td>2500</td>
<td>$3,290.75</td>
</tr>
</tbody>
</table>

Much less than what 100 subscribers would pay for access to 5 Journals and a series of Conference proceedings + the savings on registration fees.
Other benefits to IFMBE Affiliated Societies

- IFMBE grants free layout and production of IFMBE Proceedings for organizers of IFMBE sponsored and co-sponsored conferences
- Regional Young Fellows Networking Grant - IFMBE and affiliated societies each support travel of young fellows (typically post docs and assistant profs) in order to build collaboration within the region and help the growth of new leaders in the field
- Young Investigator Competition – IFMBE grants at least three awards at IFMBE co-sponsored conferences
- IFMBE presents numerous awards:
  - Vladimir K. Zwoykin Award
  - Otto Schmitt Award
  - John Hopps Distinguished Service Award
  - Student Design Award
  - Nightingale Award (in cooperation with IPEM)
  - James Zimmerman Award (in cooperation with BIOMAG)
  - IUPESM Merit Award for Biomedical Engineer (in cooperation with IUPESM)
IFMBE Projects

► From Industry Working Group
  ► Platform for searching partners for cooperation with industry
  ► Partner EUCOMED
  ► 2 year project for Middle and East Europe and for Latin America
  ► Sweden included in the pilot

► New on-line Journal on Clinical Engineering and Health Technology Assessment (open access)

► Acquisition of information on BME programs (in regions)
► Acquisition of information on accreditation requirements for BME programs (in regions)

► Regular activities of different Committees and Working groups
Thank You!
Taaq skal du ha !!

谢谢
고맙습니다
terima kasih

ありがとうございました
謝謝
談談
धन्यवाद
Officers Meeting : Agenda

- ICBHI 2019 activities
- HI & EH WG
- APWG
- FJC renewal. Meeting with Christoph Baumann
- IUPESM/IFMBE/IOMP meetings
- AC meeting agenda
- Cancun activities- CLAIB-CORAL. Dinner
Officers Meeting : Agenda

- Membership of /div/committees/working groups
- Constituent Society data with the number of members set cleaned
- Treasures-dues paid last three years
- Budget-related activities
- Registration in France and Belgium
- 60th Anniversary Celebration
- Update conferences 2019, 2020, 2021
- Review reimbursement/ no. of night accommodation
Officers Meeting : Agenda

- CORAL Summer School
- WHO activities & relationship
- WFEO in Slovenia 2019 8th April
- Details of IUPESM meeting in Kuwait 2019
- IUPESM 2020 in Slovenia Porto Roz
- IFMBE 2020 in Slovenia
Officers Meeting : Agenda

- NBC 202X Iceland
- IFMBE 2021 in Singapore
- ICBHI 2021
- WFEO in Melbourne Nov. 2019 RM/SM/EL/JG
- COS meeting; review access to website
- Awards at Closing ceremony
- AOB
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Proposal for activities in HI & EH WG

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Proposed activities for HI & EH WG
Education subgroup
S Krishnan & R Magjarevic

- Keynote on graduate degree models in Health Informatics (SK)
- Panel discussion: How do we implement courses/tracks in HI BME programs; collaborating with Hospitals & HIT industry?
- Panelists include SM Krishnan, R Magjarevic, P Carvalho, L Lhotska, N Maglaveras, M Nyssen, Reps from Hospitals/HIT/Govt (European)
- Possible demo/booth by HIT vendor on EHR, Interoperability
Considering that Member States recognized in resolution WHA60.29 and WHA67.20 that medical devices are indispensable for health care delivery but their selection, regulation and use present enormous challenges, the 3rd WHO Global Forum on Medical Devices is to be presented 10 years later to discuss the achievements that have been made in the field and the enormous challenges in low and middle income countries. This serves as an opportunity to share the WHO EMP strategy in the framework of Universal Health Coverage and the Sustainable Development Goals.

WHO 4th Global Forum on Medical Devices

- 1200 international participants
- Including several IFMBE Officers, AC members and Division and Committee Chairs
- Numerous presentations by IFMBE, CED and HTAD
- The delegates had a pleasant & productive 4GFMD
- We look forward to seeing you in 5th GFMD and various regional conferences hosted by IFMBE
IFMBE Structure of Governing Bodies

IFMBE General Assembly

Council of Societies (CoS)

Division
Clinical Engineering
Healthcare Technology Assessment

Working Groups
Asian-Pacific Activities
Industry
Health Informatics and e-Health
Engineering Biology *
Global Health *
Young Researchers *

* NEW INITIATIVES

Committees
Awards
Finance
Strategic Planning
Bioethics
Constitution & Bylaws
Education & Accreditation
Women in BME
Conference
Nominating
Federation Journal
Membership
Publications
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Strategic Planning
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New Hospital Facilities: Medical Equipment and Systems

- Small Hospitals: similar approaches
- Coordination with secondary and Tertiary Care
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- Continuum of Care
- Home Health care modalities
- Patient engagement, Care taker engagement
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mall Hospitals
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