



# Telehealth ~Telehealth 2006~

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- Technical Committee on Telecommunications

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V. Kumar - Indian Institute of Technology, Roorkee, India

E.W. Lang - University of Regensburg, Germany

A. Lazakidou - University of Piraeus, Greece

J.A. Leja - Western Michigan University, USA

H.U. Lemke - Technical University of Berlin, Germany

L. Liu - University of Alberta, Canada

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S. Sarangi - Cardiff University, UK

R. Satava - University of Washington, USA

G. Scheuermann - University of Leipzig, Germany

R. Scott - University of Calgary, Canada

G.W. Shannon - University of Kentucky, USA

A. Sherstyuk - University of Hawaii, USA

E. Sheybani - Virginia State University, USA

G. Silverman - Manhattan College, USA

M. Stachura – Medical College of Georgia, USA  
R. Summers – Loughborough University, UK  
P. Taylor – University College London, UK  
G.Y. Tian – University of Huddersfield, UK  
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M.-F. Vaida – Technical University of Cluj-Napoca, Romania  
D. von Lubitz – MedSMART, Inc., USA  
M. Watanabe – University of Calgary, Canada  
G. Weatherburn – Buckinghamshire Chilterns University College, UK  
P. Whitten – Michigan State University, USA

Laurie Wilson – CSIRO ICT Centre, Australia  
Linda Wilson – Charles Sturt University, Australia  
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Y.D. Yao – Stevens Institute of Technology, USA  
C. Zaharia – Asociata Laser Medical & Telemedicina Moderna, Romania  
J.F. Zelasco – University of Buenos Aires, Argentina  
Z. Zhang – Binghamton University, USA  
K. Zielinski – AGH University of Science and Technology, Poland  
N.A.M. Zin – University Sains Malaysia, Malaysia  
M. Zolfo – Institute of Tropical Medicine, Antwerp, Belgium

## **PLEASE NOTE**

- ❖ Paper presentations are 15 minutes in length with an additional 5 minutes for questions.
- ❖ Report to your Session Chair 15 minutes before the session is scheduled to begin.
- ❖ Presentations should be loaded onto the presentation laptop in the appropriate room prior to your session.
- ❖ End times of sessions vary depending on the number of papers scheduled.

## PROGRAM OVERVIEW

### Monday, July 3, 2006

- 07:00 – Registration  
08:30 (Max Bell Central Foyer)
- 08:30 – Welcome Address  
09:00 (Max Bell 252)
- 09:00 – Keynote Address –  
“Researching and Evaluating the  
Impact of e-Health and Telehealth  
Rollouts through the Eyes of the  
Health and Industry Sectors”  
(Max Bell 252)
- 10:00 – Coffee Break  
10:30 (Max Bell Central Foyer)
- 10:30 – Session 1 – Clinical Services I  
(Max Bell 252)
- 14:00 – Session 2 – Clinical Services II  
(Max Bell 252)
- 15:00 – Coffee Break  
15:30 (Max Bell Central Foyer)
- 15:30 – Session 2 Continued
- 16:30 – Telerehabilitation Forum:  
17:30 Applications and Opportunities  
(Max Bell 252)
- 18:00 – Optional Evening Tour –  
21:00 “Gondola Ride and Dinner”

### Tuesday, July 4, 2006

- 09:00 – Keynote Presentation – “Wireless  
Sensor Networks for Healthcare  
Monitoring” (Max Bell 252)
- 10:00 – Coffee Break  
10:30 (Max Bell Central Foyer)
- 10:30 – Session 3 – Methods and Systems I  
(Max Bell 252)

- 14:00 – Tutorial Presentation -  
“Fundamentals of Telehealth”  
(Max Bell 252)
- 15:30 – Coffee Break  
16:00 (Max Bell Central Foyer)
- 16:00 – Tutorial Presentation Continued
- 19:00 – Group Picture  
(In front of the Main Dining Room)
- 19:15 – Dinner Banquet  
(Donald Cameron Hall Private  
Function Room)

### Wednesday, July 5, 2006

- 09:00 – Session 4 – Methods and Systems II  
(Max Bell 252)
- 10:30 – Coffee Break  
11:00 (Max Bell Central Foyer)
- 11:00 – Session 4 Continued
- 14:00 – Session 5 – Web and Videos  
(Max Bell 252)
- 15:30 – Coffee Break  
16:00 (Max Bell Central Foyer)
- 16:00 – Session 5 Continued

### Thursday, July 6, 2006

- 08:00 – Optional Full Day Tour -  
18:30 “Discover Grizzly Bears at Golden  
Reserve”

## **MONDAY, JULY 3, 2006**

### **07:00 – 08:30 REGISTRATION**

*IASTED Staff: H. Saito*

*Room: Max Bell Central Foyer*

### **08:30 – 9:00 WELCOME ADDRESS**

*Presenter: F. Pinciroli (Italy)*

*Room: Max Bell 252*

### **09:00 KEYNOTE ADDRESS – “RESEARCHING AND EVALUATING THE IMPACT OF E-HEALTH AND TELEHEALTH ROLLOUTS THROUGH THE EYES OF THE HEALTH AND INDUSTRY SECTORS”**

*Presenter: P. Jennet (Canada)*

*Room: Max Bell 252*

Integrating e-health solutions into health and health care activities can impact patient safety, quality care, and efficiencies. Multi-disciplinary and multi-partnered research and evaluation activities continue to provide evidence contributing to such statements. In this presentation, the broad range of research and evaluation activities currently undertaken will be discussed, as will the drivers behind this phenomenon. Gaps and challenges in such work will be outlined and examples of successful investigations will be shared. Guiding principles and

barriers to these collaborative ventures will also be discussed.

**Dr. Penny Jennett**, Professor, Community Health Sciences (past and founding Head, Health Telematics Unit; past Director, Office of Medical Education), Faculty of Medicine, University of Calgary is recognized internationally for her expertise in telehealth, e-health, and health telematics, informatics, and education. She is a member of the Board and Executive, and Past-President of the Canadian Society of Telehealth (CST). Furthermore, Dr. Jennett was a member of the Board and Executive of the Canadian Network for the Advancement of Research, Industry, and Education (CANARIE) Inc., and currently serves as Vice-Chair of the Board of Netera. She is currently Project Lead for the 1.2M e-Health Industry Project, funded by Alberta Innovation & Science and Western Economic Diversification. Dr. Jennett received an honorary lifetime membership in the CST and was honoured by her colleagues for her contributions to telehealth in Canada, as well as her commitment in building the University of Calgary Telehealth Program.

### **10:00 – 10:30 COFFEE BREAK**

*Location: Max Bell Central Foyer*

## 10:30 – SESSION 1 – CLINICAL SERVICES I

*Chairs: P.O. Bobbie (USA) and P.A. Venkatachalam (Malaysia)*  
*Room: Max Bell 252*

512-016

High Resolution of the Low-Level Signals of the ECG by Polynomial Approximation as Compensation for Signal Averaging

*S. Jurko and G. Rozinaj (Slovak Republic)*

512-046

A Signal Processing Module Integrated Expert System for Diagnosing Heart Diseases  
*F. Javed, P.A. Venkatachalam, and A.F.M. Hani (Malaysia)*

512-027

Specialist Pediatric Cardiology Advice by Telemedicine  
*G. Weatherburn, R. Dowie, H. Mistry, and T. Young (UK)*

512-057

A Medical Network for Teleconsultations in Brazil and Columbia  
*I. Sachpazidis, S. Kiefer, P. Selby, R. Ohl, and G. Sakas (Germany)*

512-050

Telemedicine: A Mote-based Data Acquisition System for Real Time Health Monitoring  
*P.O. Bobbie, C. Deosthale, and W. Thain (USA)*

## 14:00 – SESSION 2 – CLINICAL SERVICES II

*Chairs: L. Liu (Canada) and S.B. Troen (USA)*  
*Room: Max Bell 252*

512-043

Using Videophones as Intergenerational Connections for Quality of Life Issues  
*S.B. Troen (USA)*

512-056

Distance Delivery of Geriatric Consultation to Family Physicians in Rural Alberta: Preliminary Results  
*L. Liu, J. Triscott, B. Dobbs, L. Strain, S. Burwash, S. Cleary, T. Hopper, and S. Warren (Canada)*

512-053

Mobile Documentation System for Emergency Medical Services  
*M. Hassinen, M. Marttila-Kontio, M. Saesmaa, and H. Tervo (Finland)*

512-042

Meeting User Needs for Quality – Design and Technical Evaluation of a Telehealth System for Critical Care  
*J. Li, L.S. Wilson, S. Hansen, R. Qiao A. Krumm-Heller, S. Stapleton, P. Cregan, and M. Murphy (Australia)*

512-033

An Analysis System for the Improvement of Ambulance Services for Patients Showing Cardiac Arrest

*C. Carugati, G.P. Rossi, S. Bonacina, and G. Brambilla (Italy)*

**15:00 – 15:30 COFFEE BREAK**

*Location: Max Bell Central Foyer*

**15:30 – SESSION 2 CONTINUED**

**16:30 - TELEREHABILITATION FORUM: APPLICATIONS AND OPPORTUNITIES**

*Organizer: L. Reimer (Canada)*

*Room: Max Bell 252*

The Alberta Centre for Telerehabilitation is hosting a reception and forum to network with those interested in telerehabilitation. We would like to hear about your current activities and explore possible technology applications and research opportunities in delivering rehabilitation services at a distance. All conference attendees are welcome to attend.

**18:00 – 21:00 – OPTIONAL EVENING TOUR – “GONDOLA RIDE AND DINNER”**

*Meeting Place: Professional Building Centre Lobby*

*Departure Time: 18:00*

*Arrival Time: 21:00*

Awaiting you at the end of an 8 minute gondola ride to the top of Sulphur Mountain you will have the choice of exiting the building to witness the breathtaking views in every direction or going up into the restaurant area where you can sit in comfort and still admire the view. At the restaurant we will have a delicious dinner.

The gondola upper terminal offers restaurant options, a gift shop and a spectacular roof top observation area with interpretive material giving directions and distances to major cities of the world and commemorating the area's designation as a UNESCO World Heritage Site.

**TUESDAY, JULY 4, 2006**

**09:00 – KEYNOTE PRESENTATION - “WIRELESS SENSOR NETWORKS FOR HEALTHCARE MONITORING”**

*Presenter: W. New (USA)*

*Room: Max Bell 252*

**Dr. William New** is widely recognized as a visionary creator of commercially-successful innovative medical electronics,

including the Nellcor pulse oximeter and the Natus infant hearing screener. He was the founder and executive chairman of both companies through twenty years of high growth and their subsequent public stock offerings.

The pulse oximeter monitors oxygen levels in the blood of anesthetized patients using non-invasive electro-optical spectrometry of pulsatile blood in the finger tip, a safety product now found in virtually every operating theatre worldwide. Dr New later founded Natus to provide automated hearing screening for newborns, with over twenty million babies now tested worldwide by rapid detection of brainwaves evoked from barely audible click sounds in each ear. He was recently elected a Fellow of the American Institute of Medical and Biological Engineering in recognition of his lifetime contributions to healthcare.

Dr. New received his BS and MS degrees in Electrical Engineering from Stanford University, his MD from Duke University, a PhD in Physiology from UCLA, and his MBA from Stanford Graduate School of Business. He retired from the Stanford University School of Medicine faculty after 25 years of service. His clinical specialty was cardiovascular and

heart transplant anesthesia, and his research studies focused on the design and development of biosensors integrated with bedside digital instruments for intensive physiologic monitoring and life support.

Dr. New is presently Chairman and CEO of Adigy, an early stage company developing wireless biosensors to inexpensively, continuously, unobtrusively and ubiquitously monitor health and disease across clinically important patient populations, including elderly citizens, those with unstable metabolic, cardiorespiratory, and neurologic impairments, pregnant mothers and their babies, and at-risk children. Monitoring dispersed populations in the community presents a variety of challenges and opportunities not encountered with conventional expensive medical measurements in individual patients confined to hospitals and other highly controlled environments.

Dr. New has joined the Faculty of Applied Science at Simon Fraser University as adjunct professor and member of the Dean's Advisory Council to help guide university development of new cross-disciplinary bioengineering programs. In spare moments, Bill enjoys the family vineyard in Napa Valley planted with award-winning Beaujolais - and dreams

of growing even higher quality Pinot Noir in British Columbia someday, every vine individually tracked by a wireless monitor of its nanoclimate.

**10:00 – 10:30 COFFEE BREAK**

*Location: Max Bell Central Foyer*

**10:30 – SESSION 3 – METHODS AND SYSTEMS I**

*Chair: S. Bonacina (Italy)*

*Room: Max Bell 252*

512-052

Secure Federated Data Retrieval in Clinical Trials

*A. Stell, R. Sinnott, and O. Ajayi (UK)*

512-008

Electronic Health Record for Scoliosis Management

*D. Hill, M. Fedorak, E. Lou, M. Moreau, J. Mahood, and V. James Raso (Canada)*

512-031

Modeling a Central Nervous System Biosignal Federated Databank for Parkinson's Disease  
*S. Marceglia and S. Bonacina (Italy)*

512-049

Integrated Wireless-based Medical Information Processing: System Analysis and Simulation  
*H. Qu, L.Y. Wang, H. Wang, Q. Cheng, E. Yaprak, and H. Zheng (USA)*

512-023

An Effective Infrastructure Design for the Clinical Guidelines Systems

*S. Bonacina (Italy)*

**14:00 – TUTORIAL PRESENTATION – “FUNDAMENTALS OF TELEHEALTH”**

*Presenters: S.C. Simmons, P.J. Kragel, G.L. Jones, J.Q. Mallette, and R. Hoyer (USA)*

*Room: Max Bell 252*

The *Fundamentals of Telehealth* tutorial will combine the practical experience and lessons learned from the nearly 14-year operation of the ECU Telemedicine Center with the evidence, theory, and best practices from the literature to provide a unique combination of theory and scholarship that is grounded in reality. The tutorial has the following educational objectives.

- Understand the basic definitions, theory, and history of telehealth and telemedicine.
- Learn the fundamentals of widely used and accepted technologies and standards telehealth.
- Understand the clinical considerations and applications of telehealth and the unique requirements of

remote practice and various specialties.

- Gain knowledge and practical experience in the administrative, technical, and clinical aspects of an operational telehealth center.
- Identify emerging trends and technologies that will influence the future of telemedicine and telehealth practice.

The intended audience is practicing physicians, nurses, allied health professionals, and administrators who are interested in starting up a new telemedicine/telehealth program or service, or those who want to gain a broad practically-based understanding of telehealth/telemedicine theory and practice. Engineers and technical personnel will also gain from learning about the non-technical aspects of telehealth that are critical to its successful implementation.

### **15:30 – 16:00 COFFEE BREAK**

*Location: Max Bell Central Foyer*

### **16:00 TUTORIAL PRESENTATION CONTINUED**

### **19:00 GROUP PICTURE**

*Location: In Front of the Main Dining Room*

### **19:15 DINNER BANQUET**

*Location: Donald Cameron Hall Private Function Room*

## **WEDNESDAY, JULY 5, 2006**

### **09:00 – SESSION 4 – METHODS AND SYSTEMS II**

*Chair: D. Smutek (Czech Republic, Japan)*

*Room: Max Bell 252*

512-012

Canadian Regulatory Developments on Active Medical Implants and Wireless Medical Telemetry

*T. Lacombe, D. Warnes, H. Nappert, and J.-C. Brien (Canada)*

512-010

Developing System for Remote Clinical Evaluation of Computed Tomography and B-Mode Ultrasound Images

*D. Smutek (Czech Republic, Japan), A. Shimizu (Japan), L. Tesar (Japan, Czech Republic), H. Kobatake, S. Nawano (Japan), and P. Maruna (Czech Republic)*

512-048

The Influence which Visual Communication System Effects on Elderly People

*H. Sato, S. Murata, K. Fujimura, Y. Ito, K. Ogura, T. Watanabe, Y. Fujino, T. Mochizuki, T. Tsuboi, A. Miyajima, and S. Takagi (Japan)*

512-801

Mobile Agent Architecture for Mobile Systems for Telehealth and Telemedicine

*G. Pour and N. Laad (USA)*

512-021

A European E-Learning Experience in Upper Limb Telerehabilitation

*C. Giacomozzi, D. Cordella, M. Rogante, S. Scattareggia, R. Magni, M. Zampolini (Italy), M.B. Guitart (Spain), S. Ilsbroukx (Belgium), and B. Huijgen (The Netherlands)*

### **10:30 – 11:00 COFFEE BREAK**

*Location: Max Bell Central Foyer*

### **11:00 – SESSION 4 CONTINUED**

### **14:00 – SESSION 5 – WEB AND VIDEOS**

*Chair: F. Pinciroli (Italy)*

*Room: Max Bell 252*

512-051

Impact of a Videoconference Brain Injury Rehabilitation Curriculum on the Clinical Practice of Participants

*D.S. Gray, C. Richards, M. Konrad, and E. Tian (Canada)*

512-055

Exploring Multi-Agent Autonomic Architectures for Telehealth Systems

*G. Pour (USA)*

512-028

Telebioinformatics Services of Politecnico Di Milano for Post-Genomic Biomedical Applications

*M. Masseroli and F. Pinciroli (Italy)*

512-040

Beyond Videoconference: A Literature Review of Store-and-Forward Applications in Telehealth

*L. Reimer, L. Liu, and I. Henderson (Canada)*

512-038

Internet based Telehealth in Speech Pathology: Results of Preliminary Trials

*L. Wilson, L McAllister, J. Atkinson, and P. Sefton (Australia)*

512-044

Videoconferencing in the In-Service Education of Health Care Staff in Northern Finland

*H. Alatalo, R.-L. Kortesuoma, M.-L. Kuusimäki, and J. Moring (Finland)*

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**IASTED would like to thank you for attending TELEHEALTH 2006. Your participation helped make this international event a success, and we look forward to seeing you at upcoming IASTED events.**

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**15:30 – 16:00 COFFEE BREAK**

*Location: Max Bell Central Foyer*

**16:00 – SESSION 5 CONTINUED**

**THURSDAY, JULY 6, 2006**

**08:00 – 18:00 – OPTIONAL DAY TOUR – “DISCOVER GRIZZLY BEARS AT GOLDEN”**

*Meeting Place: Professional Business Centre Lobby*

*Departure Time: 8:00*

*Arrival Time: 18:00*

Visit the orphaned grizzly bear Boo as he romps and plays in natural bear habitat. Your guided sightseeing tour to the Grizzly Bear Refuge also includes stops at Lake Louise, Takakkaw Falls, and Kicking Horse Canyon. Ride the gondola at Kicking Horse Mountain for an eagle’s eye view of grizzly country, walk the summit trails, and dine on a gourmet lunch at Canada’s highest restaurant.

Experience an up-close visit with Boo, the resident bear of the refuge.