International Seminar

Healthy and Sleep Stimulating Bed Micro-Environment

Program

12:30 Registration

13:00 The "Healthy and sleep stimulating bed micro-environment" project
   Funded by The Danish Agency for Science, Technology and Innovation,
   International Network programme
   Prof. Arsen Melikov, Technical University of Denmark

13:20 How can we evaluate quality of sleep easily without disturbing sleep
   Prof. Keisaku Fujimoto, Shinshu University School of Health Sciences, Japan

13:40 The impact of temperature changes on sleep and thermoregulation.
   Prof. Kazuyo Tsuzuki, Toyohashi University of Technology, Japan

14:00 Sleep and bed micro-environment. Relevance for sleep quality and daytime functioning.
   Prof. Poul Jørgen Jønnum, Danish Center for Sleep Medicine, University of Copenhagen

14:20 Is bedroom temperature and air quality important for sleep quality and next day performance?
   Summary of the published evidence.
   Prof. Pawel Wargocki, Technical University of Denmark

14:40 Evaluation of Thermal Environment Considering Body Movement during Sleep
   Prof. Shin-ichi Tanabe, Waseda University, Japan

15:00 Coffee break

15:20 Fiber Bragg Grating measurement system for bed environment
   Prof. Koyama, Shinshu University, Japan

15:40 Control of bed micro-environment: passive and active methods
   Prof. Arsen Melikov, Technical University of Denmark

Please turn over → → → → → → → → → → → → → →
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16:00 Discussion on a platform of future research and development on sleep

• Basic research on sleep
  o What is high quality sleep?
  o What is the importance of its stages (next day performance, wellbeing, etc.)?
  o How sleep can be controlled (human body physiological signals, control of sleep stages, etc.)
  o How to define differences in sleep between people and how to benefit for providing better sleep
  o Importance of environmental parameters (thermal, air quality, sound, light) and their interaction
  o Importance of bed comfort, feeling, smoothness, softness, stiffness, weight, thickness, etc. of pillow, quilt, mattress, bedding
  o ?????
  o ?????

• Sleep monitoring and control
  o Body physiological signals (brain waves, skin temperature, eye movement, exhaled air, etc.)?
  o Body movement?
  o Sensors and requirements (accuracy, non-intrusive, wearable, wireless, size, etc.)
  o Sleep predicting models
  o Control strategies
  o ?????
  o ?????

• Technology for providing healthy and sleep stimulating conditions
  o Advanced solutions for generating optimal room conditions (thermal, acoustic, light, air quality)
  o Advanced solutions for generating optimal personalized bed micro-environment
    ▪ Combined impact of room and bed-microenvironment temperature on sleep quality
    ▪ Human response to non-uniform bed thermal environment
    ▪ Sensing and responding pillows, quilts mattresses, bedding improving sleep quality
    ▪ Health care supporting bed components – continuous monitoring of human body and wireless transmission of data
    ▪ ?????
    ▪ ?????

17:10 Summary of discussion
17:30 End of seminar