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2nd Annual White paper on the structured dialogue

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Please return to Sonnini Yura – s.yura@elsevier.com

Working title

Titles and subtitles should be focused to include key terms that readers would use if searching for information on this topic.

Robotics for the elderly
From ideas to concrete solutions

Author information

Please list all authors or editors, including contact details, qualifications and experience, and outline why you are you the right individual or team to prepare this book.

Editors

- Francesco Maurelli

Technical University of Munich
Institut für Informatik VI
Technische Universität München
Schleißheimerstr. 90a
85748 Garching bei München - Hochbrück
Germany
f.maurelli@ieee.org

Dr. Maurelli is currently Scientific Project Manager of Echord++, one of the biggest EU-funded projects in robotics, at the Technical University of Munich. Its main aim is to bring robotics technology from the lab to the market. In the framework of ECHORD++ he is active in several robotics initiatives involving medical robotics, and in particular its use for elderly care. He has co-organised a workshop at IROS 2016 on the topic: “Robotics for the Elderlies: Involving Science, End Users and
Public”. He holds a PhD from the Edinburgh Centre for Robotics, and has been active in the robotics community for several years. His strong scientific background, his involvement in the topic of the book, as well as his robotics network, make him the right editor for the book.

- Franziska Kirstein

Blue Ocean Robotics
Niels Bohrs Alle 185
5220 Odense
Denmark

Franziska Kirstein is currently Human-Robot Interaction Expert at Blue Ocean Robotics. Blue Ocean Robotics is a creator of emerging robotic solutions, -enterprises & -markets and was recently recognized as one of the 20 Most Promising Robotics Solution Providers of 2016 by CIOReview. In their Innovation Projects, Blue Ocean Robotics deploy and develop new robotic solutions in close cooperation with end-users in different market segments, including healthcare. Franziska is project manager for ECHORD++ on behalf of Blue Ocean Robotics who are involved in the PDTI Healthcare challenge. In connection to this challenge, Franziska has co-organised a workshop at IROS 2016 on the topic: "Robotics for the Elderlies: Involving Science, End Users and Public".

Franziska has received her MA in Int. Business Communication & Communication Design from University of Southern Denmark. As a communication designer she explores design opportunities from a user-centered approach and robotics technology can be made easier for users. Her scientific involvement in the topic of the book, the practical experience from Innovation Projects and developing healthcare robots (Robi-X) as well as the connected network from both areas make her an ideal candidate as an editor.

Authors and Reviewers

The complete list of authors will be available only after acceptance of the book proposal. Also, we aim to have peer reviewed chapters, in order to increase the quality of the book.
We have made some initial contacts with:

- Dr. Christophe Leoroux, (CEA, France)
- Dr. Elizabeth Broadbent, Associate Professor (University of Auckland, Faculty of Medical and Health Sciences)
- Dr. Bruce MacDonald, Associate Professor (University of Auckland, Faculty of Engineering)
- Dr. Marcel Heerink, Associate Professor (Windesheim Flevoland University of Applied Sciences; LaSalle University)
- Dr. Vanessa Evers, Full Professor (Twente University)
- Dr. Claus Risager, PhD in Robotics & Artifical Intelligence (Co-CEO Blue Ocean Robotics)
- Dr. Thiusius Rajeeth Savarimuthu, Associate Professor (University of Southern Denmark, The Maersk Mc-Kinney Moller Institute)
- Dr. Alberto Sanna, Director, e-Services for Life and Health, Scientific Institute San Raffaele, The San Raffaele Smart City, Milan, Italy.
- Dr. Amit Kumar Pandey, Head Principal Scientist (Chief Scientist), SoftBank Robotics, Paris, France

Background and purpose

· Please 'set the scene'. What is your purpose in writing this book? Include any background that helps to explain why there is a need for a new resource in this area.	The profile of aging in the world is changing dramatically since the second half of the 20th century and will continue changing in the future. According to *Population ageing and development*[1] the average life expectancy at birth has increased from 47 years in 1900 to over 78 years in 2008. There are approximately 810 million persons aged 60 years or over in the world in 2012 and this number is projected to grow to more than 2 billions by 2050. There is a strong association between the presence of geriatric syndromes (cognitive impairment, falls, incontinence, vision or hearing impairment, low body mass index, dizziness) and dependency in activities of daily living. However, decline in function and loss of independence is not an inevitable consequence of aging. Given the high prevalence and impact of chronic health problems among older patients, evidence-based interventions to address these problems have become increasingly important to maximise both the quantity and quality of life for older adults. In this context, the use of robotics to assist elderly people is of increased interest. After initial lab activities, robotics solutions have been validated in clinical trials and are progressively being used with patients and medical staff. A book that analyses the current state and the research directions represents therefore a very useful resource in this new emerging area.
· Definition of topic (in laymen's terms—so that a non-scientist can understand why this work is important):	This book aims to present various approaches of robotics for elderly people. We will present not only scientific contribution, but also the perspective from end-users and medical staff involved in the process, with a particular attention for clinical trials.
· Short "blurb"/brief description of topic which could be used for promotional purposes	The world is getting older and older. By 2050 more than 2 billions of people will be over 60 years old. Roboticists have taken up the challenge of helping an ageing society to function better. Better for the patients, better for the doctors, better for the overall health system. This book analyses state-of-the art approaches to support various conditions linked to age and the supportive role of robotics. Results from clinical trials will be featured, as well as not only the point of view of the scientists but also of the people who have interactive with robotics solutions.

[1] Population ageing and development 2012. Department of Economics and Social Affairs of United Nations. www.unpopulation.org

Benefits to audience	This book will give an overview of an emerging area which is of increasing importance. The readers will:
· List some unique features of your book which will attract prospective buyers:.	- - Get an overview of the aging process in the world Get an overview of the various challenges related to this phenomenon - Get an overview and an in-depth analysis of robotics solution to those challenges - Get scientific and technical insights about the problems tackled and the solutions proposed - Get important feedback information and case stories from end users

What problem does this book solve

· Clearly explanation how this content will help an end user. How will they use the content in their work? At what point in the researcher work-flow does this help them solve a problem? What problems will this this help them solve?

We need to differentiate the various categories of “end-user” for the book, as each of them have different needs and problems they wish to solve (this is also related to the target audience):

- **Students** (Medicine, Informatics, Electronics, Robotics, Social Sciences, Philosophy, etc.): they will get an analysis of the state-of-the-art, with various contributions from relevant scientists. They need to have a reference book to get insights in this emerging area;

- **Researchers**: the scientific contributions will be the basis for researchers to build on top of the presented results. They could find a very well organised state-of-the-art, with an analysis and indications of future directions. So, the book would be useful for both at starting point, to have useful indications of available techniques and their limitation, and at development point, to have a set of benchmarks to evaluate own research;

- **Medical Personnel/ Organizations /Institutions:** the book will help them understanding how robotics solution could help them in treating elderly people. Therefore it represents an important tool to promote cutting-edge innovation and the introduction of state-of-the-art technology in an important sector of the society

- **Politicians (and their offices):** they will get important statistical data about ageing society and they will have the basis to push for policies to facilitate the introduction of innovative solutions in the health system. Such reference books are not widely available and this book aims to fill this need;

- **Robotics manufacturers and providers**: they will be able to see the current hot topics in the area and the

	practical advantages of the proposed solutions and this might sprone them to open new market opportunities Additionally, the chapter on case stories of implemented projects, experiences and lessons learned are very useful for a broad spectrum of stakeholders to see in practice what worked and what are promising directions. It can provide a kind of "User Guide" for implementing robotics solution according to the end-user needs, and not from a pure scientific point of view. The chapter on involvement of public bodies will provide guidelines on the Pre-Commercial-Procurement process, which is very valuable, considering the growth of this instrument to finance close-to-market research activities.

Target audience

Identify the readership for your book

Primary Market (include level—undergraduate, graduate, professional, reference—as well as job titles of prospective readers):	We believe that the primary market for this book would be researchers at PhD level, from PhD candidates to academics. Main disciplines are Medicine, Informatics, Electronics, Robotics, Social Sciences and Philosophy. Usually university libraries are keen in acquiring new books in such emerging fields.
Secondary Market (include level—undergraduate, graduate, professional, reference—as well as job titles of prospective readers):	The secondary market includes all the stakeholder categories in such transectorial topic. In particular: - Medical Personnel/ Organizations /Institutions interested in emerging technologies such as robotics for elderly care - Robotics manufacturers and providers - Politicians in order to have an overview of the topic and support data for policy development
International or Global Market (is there a significant international audience for your book—if so, please describe the importance of the topic to the particular international community):	The topic addressed by this book is of international relevance. The ageing aspects is related to the overall world population. In particular, the tendency is more remarkable in East Asia, Europe and North America, and we believe that those will be particular receptive geographical areas for the book.
Indicate any societies, professional organization, companies or other groups that might purchase your book in quantity:	The project ECHORD++ is interested in the book and might purchase some copies. The exact quantity depends on the price and available resources (around 50 - 100 copies) With the professional support of Elsevier, we will also market specific professional societies (like medical societies,

	euRobotics and other specialized initiatives in the area e.g. Patient@home), but at this stage it is hard to say if there will be a bulk order or if this targeted marketing will result in individual orders.

Competition

- Please list in order of importance any books that compete directly with or are similar to your book. Please supply (if possible) author/editor, publisher, publication date/year, price and any further information you feel is relevant (use separate sheet, if necessary):
- Please note: if you are inclined to answer "none" to this question, please tell us where your intended audience currently gets information about this topic…e.g., conferences, tutorials, journal articles, web forums, etc. please be as specific as you can.

[1]

The main source of information available to the community comes from publications in journals and conferences. As this is a cross-sectoral topic, related publications can be found both in medical journals and in robotics journals.

There are some books which are related to the topic:

- Andrew Sixsmith (Editor), Gloria Gutman (Editor). Technologies for Active Aging. Series: International Perspectives on Aging (Book 9); Paperback: 228 pages; Publisher: Springer; 2013 edition (June 12,2015); ISBN-13: 978-1489999115, 149$ - 221 pages

To the best of the editors' knowledge, this is the closest available book to the one proposed. There are however significant differences: the published book is focused on ICT in general, whilst the proposed book is more specific about robotics solutions.Additionally, it seems focused more on home-based solutions, whilst in the proposed book we plan to address various scenarios where robotics technology can be useful, ranging from homes to hospitals, to rehabilitation centres.

- Abdelsalam Helal (Author), Mounir Mokhtari (Author), Bessam Abdulrazak (Author). The Engineering Handbook of Smart Technology for Aging, Disability and Independence 1st Edition. Hardcover: 944 pages; Publisher: Wiley-Interscience; 1 edition (September 16, 2008); ISBN-13: 978-0471711551, 367$

Part IV of this handbook focuses on assistive robotics. However there are two main shortcomings we aim to solve with our proposal. The first one is the nature of the book. Being an handbook, it has several chapters and sections without them being very connected, whilst our proposal is overall more coherent. On the other hand, it is a work from 2008, this means that there is a ten-year gap between the handbook and our estimated publishing date. Our book proposal has also important sections which are missing, like the link to the pre-commercial-procurement activities and feedback from end users.

- Samer Mohammed (Editor), Juan Moreno (Editor), Kyoungchul Kong (Editor), Yacine Amirat (Editor). Intelligent Assistive Robots: Recent Advances in Assistive Robotics for Everyday Activities. Series:Springer Tracts in Advanced Robotics (Book 106); Paperback: 448 pages; Publisher: Springer; Softcover reprint of the original 1st ed. 2015 edition (October 12, 2016); ISBN-13: 978-3319381664; 129$

	This book has some overlap with our proposed book. However, the proposed book puts the end-user perspectives, together with input from public bodies at a much higher place than the published one. Additionally the topic of robotics for elderly care goes behind the general assistive robotics area, and content-wise the structure of the two are quite different. • Joost van Hoof (Editor), George Demiris (Editor), Eveline Wouters (Editor). Handbook of Smart Homes, Health Care and Well-Being 1st ed. 2017 Edition. Hardcover: 664 pages; Publisher: Springer; 1st ed. 2017 edition (August 25, 2016); ISBN-13: 978-3319015828 This handbook deals with smart homes and healthcare topics. Although there is some overlap with our book proposal, it is quite minimal, as we focused mainly on robotics solutions, and not on the overall topic of smart homes. It is worth noting that none of these books are published by Elsevier, so the proposed book would also be a strategic opportunity to enter into a new market.
[2]	
[3]	

Table of contents Please include here a tentative ToC, organized into PARTS and the proposed chapters for every part. Tentative titles should be given to cover topics of the books and ensure coherence of the edited book volume.	Remark: *tentative* **PART I - The scene** Chapter 1: Socio-economic analysis: the aging society and the needs for elderly care **PART II - Robotics Approaches** Chapter 2: Physical Deficiencies Chapter 3: Cognitive Deficiencies Chapter 4: Sensor Deficiency **PART III - End-Users Perspective** Chapter 5: Involvement of public bodies: the success story of Echord++

Chapter 6: Case stories of implementation projects and experiences, lessons learned

PART IV - Social Aspects

Chapter 7: Acceptability

Chapter 8: Ethical Issues

Key Words

Please provide 5-10 key words or terms that might be used to search online for your book. Our goal is to make the book as "discoverable" as possible, so that when they are searching for similar topics, your book will come up.

Elderly care
Assistive Robotics for Elderly
Aging Society
User Acceptance of Robots by Elderly
Introducing Robots to the Elderly
Human-Robot User Studies with Elderly
Robots in Therapy

Specifications

- Approximately how many manuscript (typewritten, double-line spaced) pages do you expect each book to be?

We expect around 200 pages.

• How many illustrations, excluding tables, do you expect to have in each book?	We expect around 80.
• List any special physical features you expect to include (problems/solutions, photographs, disks, etc.)	We currently do not expect physical features. Maybe online repository with videos.
• Do you have the ability to prepare both the text and the illustrations electronically?	We can use LaTeX to prepare the book and place the illustrations in.
• When will initial proposals be available and how long it will it take to prepare manuscripts?	Estimated first draft time: 2018/06 Estimated completion time: 2018/12
• Any ancillary materials you anticipate providing alongside the book, e.g. downloadable code, video clips, etc.	We might provide some videos, subject to compliance with the relative data protection legislation.

Further	information
• List key meetings/conferences in this area.	• IEEE International Conference on Robotics and Automation (ICRA, annual) • IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS, annual) • IEEE International Conference on Advanced Robotics (ICAR, annual) • IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN, annual) • IEEE International Conference on Rehabilitation Robotics (ICORR, annual) • IEEE Engineering in Medicine and Biology Society (EMBS, annual) • EAI International Conference on Wireless Mobile Communication and Healthcare (MobiHealth, annual) • Digital Health World Congress (annually) • Healthcare Design (HCD, Expo and conference, annually) • Disruptive Healthcare Conference (DHC, annually) • MEDICA (trade fair, annual) • Forbes Healthcare Summit, (invite-only event for 200 CEOs, annually)

- Are there training needs that the book may satisfy? If so, identify the industry, representative companies, and the type of training involved. Does your book satisfy a college course need? If so, list the course title(s), department(s), and applications, along with estimated enrollments. Indicate whether the course is usually required and, if not, how many schools offer it.

The book could be used as additional textbook for robotics courses, especially in medicine faculties. Although currently specialised courses on this topic are rare, in the near future there will be many university courses on assistive robotics, and the book could be a valuable support for those courses. Also, healthcare institutions might use the book as a user guide to implement robotics technology. Denmark, known for being a testbed for innovation technologies[2], especially in the healthcare sector, offers specialized study programmes such as Master of Science in Public Health or MSc in Economics - Health Care Management and Economics. These study programmes could make excellent use of the book in their courses. Also graduates of these studies could be potential buyers.

Additional requirements

We can make a publishing decision based on a detailed contents list and full answers to the questions above. However, sample material is helpful in enabling reviewers to evaluate content and approach. Please provide a draft chapter or other sample content if available.

Others

Please list several people (including affiliations and email addresses if available) whose comments on your proposal you would value. These comments are important for our internal evaluation of your proposal. The more people you can suggest, the better, since not everybody we approach will take on the task and, sadly, not everyone who agrees to take on the task will complete the effort in a timely manner. Ideally, we like to use a mix of reviewers from both academia and industry, assuming your book has an audience in both communities; also, we like to use a geographically diverse (globally) group of reviewers as well.

[2] http://ec.europa.eu/public_opinion/archives/ebs/ebs_427_en.pdf

Name:	Email address:
Prof. Alberto Sanfeliu Institut de Robotica i Informatica Industrial (UPC-CSIC) Llorens i Artiga 4-6, 08021 Barcelona (Spain) T: +34 934015782 // +34 934015751 http://www.iri.upc.edu/staff/sanfeliu	sanfeliu@iri.upc.edu

Name:	Email address:
Dr. Kerstin Fischer Associate Professor at University of Southern Denmark, Department of Communication and Design Alsion 2 DK-6400- Sonderborg Phone +45-6550-1220 Mail: Kerstin@sdu.dk	
Dr. Thiusius Rajeeth Savarimuthu Assistant Professor, Postdoc University of Southern Denmark, The Maersk Mc-Kinney Moller Institute Campusvej 55 5230 Odense M Denmark Phone: 65509586	trs@mmmi.sdu.dk
Dr. Leon Bodenhagen Assistant Professor, Postdoc University of Southern Denmark, The Maersk	

Mc-Kinney Moller Institute
Campusvej 55
5230 Odense M
Denmark
Phone: 65507424
Mail: lebo@mmmi.sdu.dk