Editorial

FOREWORD TO THE THEMATIC ISSUE:
BIOMEDICAL ENGINEERING

The readers who are not so familiar with the latest advances in the field of biomedical engineering might be curious to know the reasons why a journal such as *Facta Universitatis: Mechanical Engineering* is devoting the whole issue to the matters in question. Yet this is not so difficult to guess knowing that an increasing amount of research is currently being done in biomedical engineering. Even this is in itself worth exploring considering so many aspects involved in the given area but for now we would like to stress only two of the more prominent ones.

The first reason for increasing research in the field of biomedical engineering is related to the wish to provide for the needs of a rising number of the elderly. Median age of the world population has increased from 24 to 30,9 years in the last 30 years[1]. It is predicted that by the year 2050 the number will rise to 36,8 years. This results in a dramatic increase in life expectancy. According to the World Population Ageing 2017 report[2], there were 962 million people aged 60 years or over in the whole world, which is an increase of 152% comparing with 383 million of the same population in 1980. This revolutionary change in life expectancy for only 37 years, caused by better nutrition, quality of life and better medicaments, is not in line with the evolutionary changes in the characteristics of human organs that need millennia to adapt. In order to cope up with the problems that could not be resolved by medical means only, health care industry sought help from engineering.

The second reason for an increased interest in the field of biomedical engineering is further advancement of those scientific disciplines and technologies that have proven themselves capable of solving the unresolved. A great number of them can be found in the fields of mechanical or electrical engineering, ICT, chemical engineering, biomolecular engineering and the like. Of those that are close to mechanical engineering it is worth mentioning reverse engineering, additive technologies, nano materials, biomaterials, finite element method, artificial intelligence, robotics and especially nano-robotics.

Moreover, it is well known that in the seventies of the 20th century there began convergence of two disciplines, namely, of information and telecommunication technologies which in time resulted in the emergence of a new discipline – ICT. A similar process is now taking place in the areas of medicine and engineering. It is increasingly difficult to distinguish where medicine ends and engineering begins, and *vice versa*. Therefore, the term biomedical engineering is increasingly used when referring to solving problems in health care. Bearing in mind that many solutions are based on machine technologies, we have decided to prepare a thematic issue dedicated to biomedical engineering.

---

[1] Median age of the world population from 1990 to 2015 and forecast until 2100, https://www.statista.com/statistics/268766/median-age-of-the-world-population/, Accessed on Dec 7, 2018.
[2] United Nations, Department of Economic and Social Affairs, Population Division (2017). World Population Ageing 2017 (ST/ESA/SER.A/408)

The selected state-of-the-art papers presented in this issue illustrate in the best possible way multidisciplinary nature of biomedical engineering. The papers point up the achieved results in various domains of the given field, including biomaterials, reverse engineering, smart devices, additive technologies, specific modeling techniques, to name but a few. Each paper, in its own way, contributes to further development of biomedical engineering – an adventure that has just begun while offering a prosperous future. In this sense, this issue gives a large picture of the current state of development while highlighting some important paths for the future development of this inspiring field of research.

Miroslav Trajanović
Guest Editor

Osiris Canciglieri Junior
Guest Editor