Editorial

Interdisciplinary Researches in Iran III: (Multi-Dimensional) Medical Signal Analysis Softwares

In previous editorials[1,2] we explained about available fields of Inter-Disciplinary Researches (IDRs) in Iran,[2] professional, organizational, cultural obstacles, and required polices for development of IDRs in Iran.[1] In this editorial, I want to discuss about one of the IDR fields in Iran that seems to have more available conditions for marketing comparing to other interdisciplinary areas.

From many years ago electrical engineering departments nationwide have consistently been among the first choice of many thousands participant students in Iranian university entrance exam, and their graduated students have a big chance to get admitted to postgraduate studies in the top-ranked universities worldwide. Not only these departments strive to be at the forefront in their educational programs, but also we can see a considerable growth in high-quality research activities in these departments.[3] For example, according to SCImago Journal and Country Rank, the rank of Iran for the number of publications in all fields of science is 25, while this ranking is dropped to 46 in terms of H-index. In contrast, in the specific field of signal processing both number of publications and H-index have the same rank of 25, or in the field of computational mathematics the ranks in number of publications and H-index are respectively 16 and 12. It shows that along with the growth in the number of publications of Iranian researchers during current years,[4] the quality of published papers in the field of signal processing has also improved accordingly.

However, there is an important issue here that needs to be discussed. In some countries, researchers especially faculty members, are increasingly relying on outside grants for funding their researches. Although the grants are getting more competitive (e.g., the success rate of NIH R01 research grants decreased from 22.7% in 1997 to 14.6% in 2013),[5] they take lots of time for grant writing,[6] because they will receive a considerable amount of money for several years, which essentially help them to do serious and product-targeted researches during years. However, many of academic research projects in Iran are totally funded by universities, and most of the time the last stage of these projects is publishing the results in related journals, so, many of them may not result in a marketable product. It

seems one of the most important problems for academic researchers related to electrical engineering is finding suitable industry partners and high-tech companies matching to their cutting edge researches. However for signal processing related products, especially in the field of medical signal and image, this problem can be solved more easily. Many of well-known medical device companies have close collaboration with Ministry of Health and Medical Education (MHME) in Iran to sell new devices to hospitals or upgrade and service the current devices. Hence, similar to other developing countries,[7] (Multi-Dimensional) Medical Signal Analysis (MDMSA) softwares can be developed in small companies and then sold to these large companies, because (1) they have had an active presence in Iran for many years, (2) improving of MDMSA softwares of their devices are an important part of their business, (3) lots of MDMSA experts can do the related project with lower costs comparing to other countries.

In conclusion, comparing to other IDR areas in Iran, there is a more available condition for producing and marketing standard MDMSA softwares based on requirements of the related projects to time, money, personnel and teamwork. However the principal investigators in universities have to improve the capabilities of their research teams to convert the initial softwares (that can be used only for research purpose) to final product (that is a software according to requirements of end user). On the other side, although it seems that large medical device companies are interested to have joint MDMSA projects with related researchers in Iran, MHME can play very important role to start, guide and finalize these projects.

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