

# e-Health Technical Committee Newsletter

April, 2018

On behalf of the e-Health Technical Committee (TC) of the IEEE Communications Society (ComSoc), we wish all our members a very instructive reading of this letter.

The contribution from this edition is coming from The Finnish-Russian University Cooperation in Telecommunication (FRUCT), an independent Open Innovation Association developing ICT R&D ecosystem of Russia and Finland.

Members of the e-Health community are invited to contact the author for further information or collaborations.

***We also welcome all our members to share their research activities and field experiences through this open newsletter and to open up new opportunities for discussions and collaborations.***

Dr. Nada Philip (Kingston University London, UK)

Dr. Nazim Agoulmine (University of Evry Val d'Essonne, France)

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## MDDCLOUD E-HEALTH ECOSYSTEM

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### I. INTRODUCTION

The article gives an overview of e-Health activities coordinated by Association FRUCT ([www.fruct.org](http://www.fruct.org)). Our flagship project is Mobile Diagnostics Device (MDD) that creates service ecosystem to help mass-users taking good care of own health and monitoring relatives. The project core is a cloud system (MDDCloud) supported by a set of free and commercial applications. The MDDCloud is delivered in B2B and B2B2C models, and the supporting mobile apps are in B2C model. All apps have certain finalized functional and can be used independently or synchronized by the MDDCloud. To enable wider variety of business and research scenarios all apps support user-controlled (manual) and automated synchronization modes.

In manual mode the user oversees collected data and to jointly use multiple apps must follow certain procedure that ensures data consistency. The core functional is available for free use. The commercial apps addressing some specific cases of advanced scenarios, like complex diagnostics on top of multiple parameters. Some apps offer in-app purchases that facilitate work and provide additional services.

In automated scenario the user can link all his apps to the personal account in the MDDCloud. The system takes care of full sync, makes data backup and provides several additional services.

Thanks to highly flexible architecture the MDD project is good for research purposes. Several research projects have been done and currently run on top of MDD. The total number of MDD services users exceeds a million and we welcome new teams to work together.

Soon our offer will become even more attractive, as we will get access to large volume of impersonalized real-life health data. We are planning to launch the new program for the users that will offer access to a set of new apps and services in exchange to donation of anonymized personal health records. Based on preliminary study, at least 15% of the users are interested to join this program. As a result, this program shall generate sufficient volume of data for deriving statistically reliable results for predictive diagnostics based on common patterns.

Based on this data we hope that in a year from now we

will be able to release a set of new advanced free and commercial services that are based on continuous analysis of personal health records over time matching them against closest patterns in the database.

## II. MDD MOBILE APPLICATIONS

We developed a set of easy to use and efficient mobile apps for personalized health monitoring including possibility of data upload to the professional medical systems. We developed e-health apps for most popular mobile OS, as well as some exotic platforms, e.g., double-screen YotaPhone and open source Sailfish OS.

We focused on developing universal apps that support widest range of wearables, health and fitness sensors. Currently the system supports over 100 sensors of over 20 types. The cloud service platform synchronizes collected data, normalize it, enrich by the available context data on user's behaviors and the environmental conditions.

The system routines include algorithms and methods for proactive analysis of patient's health parameters. The system analyzes large number of medical and context parameters in continuous cycle for detecting new hidden interdependencies and relations. MDD has flexible architecture and set of developer tools that enables fast and efficient implementation of new services on top of our system. The system follows EU, EACU, and US standards on security and data management. Moreover, the system supports wide range of communication standards.

Now over a million users worldwide downloaded our free apps. We have three large customers with B2B contracts for paid services. The system provides complete service for health monitoring of patients with chronic diseases. It enables the new level of accuracy and quality of following patients by health centers. As a result, the system decreases cost of monitoring and increases life quality of various groups of patients.

## III. SOLUTIONS FOR HOSPITALS AND PRIVATE PRACTICES

Our service offer enables hospitals and private practice to enhance their service by the high-quality e-Health services. The key focus of our solutions is to ensure top user experience and efficient performance. The provided services allow to increase efficiency of many operations,

efficiently deal with peak load, by decreasing routine workload of medical staff (especially nurses). The provided solutions enable to organize cost efficient continuous monitoring of patients' health, plus helps to proactively detect dynamics of various health parameters. Based on customer preferences the provided service blocks can be used standalone or be integrated with medical information system used by the company. We have several deployments of the system, starting from hospital in Karelia Republic and to the special health parameters monitoring program done for Bayer.

## IV. TRULY INTERNATIONAL SOLUTION

The system supports multi-language UI and follow a few national standards. We currently support over 20 most popular world languages. In addition to already available translation we welcome community to contribute translation to new languages or update/improve current translation using special translation service <https://yar.fruct.org/translate/projects/diaries/> (all contributors are mentioned in the corresponding apps and services as our translators).

Thanks to clear and user-friendly interface in local languages we get wider distribution of the users on age and education background, comparing to competing solutions. It also helps to get more interested business partners from various countries.

## ABOUT FRUCT

FRUCT Association is established in 2007 as a cross-border cooperation framework uniting universities, R&D institutions and companies. The association has long history of cooperation with IEEE and other professional societies. FRUCT develops, productizes and delivers innovative IoT-enabled solutions for e-Healthcare, Location Based Services and Smart Services as well as provides consulting and develops business incubation framework to support needs of our customers and partners.

Nowadays the association runs multiple activities primary focused on the following regions: Finland, Russia, Scandinavia, Kazakhstan and India.

Our team has over a decade experience in development e-Health solutions. We are looking for partners that need such solutions or interested in joint development of services for healthcare, preventive and personalized medicine, fitness and sport. If you are interested, please contact us.

# IEEE Life Sciences Conference

Montreal, Quebec, Canada, 28-30 Oct 2018



## Call for Papers

The 2nd IEEE Life Sciences Conference (LSC) will be held in Montreal, Canada 28-30 October 2018. The IEEE Life Sciences Technical Community (LSTC), which is supported by multiple IEEE member societies, is the sponsor of the conference. As such, the conference will cover diverse topics within the theme. LSC 2018 will include tutorials and a scientific program composed of plenary talks, invited sessions, Lecture and poster presentations of peer-reviewed papers. In addition, there will be a host of special events, including a Standards Track, an IEEE Women in Engineering event, a High School Competition, a graduate students' competition, and other Initiatives to be announced shortly. All are encouraged to submit papers containing original contributions to be considered for presentation at LSC 2018. Accepted 4-page regular papers will be published in the conference proceedings and be submitted for inclusion in IEEE Xplore. To communicate late scientific findings and to encourage attendance by a broader audience, LSC 2018 will provide additional presentation opportunities via a second track featuring posters.

### Topics include, but are not limited to:

- Smart medical devices and technologies
- Wearable sensors and Smart garments/textiles
- Biosensor technologies, mobile-health apps
- Signal and image processing and technologies
- Data preprocessing, compression and transmission
- Data mining, cleansing, management, and integration
- Synthetic biology
- Big Data for healthcare
- Virtual reality (VR) in healthcare and medicine
- 10.Point of Care devices and technologies.
- Rehabilitation and assistive technologies
- Deep learning and pattern recognition
- Bioinformatics, and Biometrics
- Electronic medical records, and IoT for healthcare
- Brain-computer interfaces
- Wireless communication and networking
- Energy harvesting/scavenging technology
- Medical control systems
- Security and privacy, and Social implications of technology.

### Important Dates

#### **2-page & 4-page Papers**

- Submission Opens 16 Apr 2018
- Submission Due 4 Jun 2018
- Decision Notification 20 Aug 2018
- Final Paper Submission 10 Sep 2018

#### **Special session proposals**

- Submission Opens 16 Apr 2018
- Submission Due 1 May 2018
- Decision Notification 1 Jun 2018
- Final Paper Submission 30 Jun 2018

#### **Tutorial proposals**

- Submission Opens 16 Apr 2018
- Submission Due 14 May 2018
- Decision Notification 1 Jun 2018

### Contact

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**Conference Website:** <http://lsc.ieee.org/2018/>