NATIFLife Newsletter

N.2
May 2019

A Network of Assistive Technology for an Independent and Functional Life
https://natiflife-project.eu/

Interreg Italia-Malta
NATIFLife
Fondo Europeo di Sviluppo Regionale
European Regional Development Fund

UNIONE EUROPEA
EUROPEAN UNION

The NATIFLife Network Portal

INSIDE THIS ISSUE

The NATIFLife project aims at creating a new infrastructure to develop valuable solutions in the field of Assistive Technology for improving the life quality and autonomy of elderly.

The project is almost in the middle way of its two years duration. Many results have been already achieved through a strong effort of each partner involved in research, technical and dissemination activities.

Just a remind of main project objectives:
- performing networking actions and enabling services in favor of enterprises
- strengthening two Research Centers, in Catania and Malta
- developing disruptive innovative research in the field of Assistive Technologies
- realizing 2 Living Labs where innovative assistive technology can be demonstrated to end-users.

Many activities have been performed during this first project year, bringing interesting results in the field of rapid prototyping of sensing systems and assistive robotics, communication and outreach activities, living labs development.
Moreover, a strong effort has been dedicated to the growing of the NATIFLife Network, which combines skills, competencies, needs and strategies to develop an integrated approach for a convenient development of Assistive Technology, by taking into account emerging technologies and the main role of end-users.

The next review meeting which will be hold in June in Catania will be a unique occasion to wrap-up the current project status and to furtherly promote and support the NATIFLife Network, by ad-hoc training and hands-on initiatives.

I would like to thank a lot all partners who have really provided efforts to concretely implement project tasks and reach planned objectives. A lot has been done and much more has to be done during the next year.

The project coordinator
Prof. Bruno Andò
DIEEI-University of Catania, Italy

A real need of a growing society!

The ageing of the population is one of the most significant phenomena of the 21st century, which has important and far-reaching consequences for all sectors of society as an increase in the costs for social spending and services related to the aging of the population on an increasingly smaller share of working age people.

With reference to the member countries of the European Union, Eurostat data show how in the decade 2007-2017 the share of over-65 people, compared to the total population, increased by an average of 2.4% for EU countries and represented 19% of EU population in 2017. The percentage of people aged 80 or over is expected to more than double by 2080, accounting for 13% of the total population. The relationship between the number of people over 65 and the number of people of working age (15-64) will increase from 21.6% in 2016 to 51.2% in 2070. The same study estimates that the total cost of ageing related services in EU, is expected to rise from 1.7% of GDP in 2016, to 26.7% in 2070. The most significant contribution to the increase in age-related expenses, according to forecasts, will come precisely from the costs related to health care and long-term care.

The progressive demographic aging represents a series of challenges also in terms of quality of life for the elderly. In fact, one of the main social challenges concerns the possibility of guaranteeing everyone to be able to age with dignity and in safety, with a satisfactory quality of life,. This idea is the basis of the concept of "***Active Aging***", as defined by the World Health Organization: "*Active aging is the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age*". According to this definition, Active Ageing results from the combination of autonomy, independence, quality of life. The ability to take care of oneself, to carry out common ***Activities of Daily Living (ADL)*** independently, to have a socially active life and to stay healthy for as long as possible, are aspects that are gaining more and more importance among the elderly population.
The ability to perform ADLs is used to assess the functional status of people recovering from injuries or affected by chronic diseases or disabilities, and even of elderly. Thus, monitoring ADLs of elderly people can be helpful in improving their quality of life and be beneficial to their caregivers.

In this context, technology can play a strategic role to guarantee the elderly with the possibility to live, as long as possible, an autonomous, independent and healthy life in their own environments, contributing to the improvement of the safety and decentralizing part of the social-assistance activities from healthcare facilities to the users' residences. This represents an enabling step towards implementation of new social assistance models.

According to the definition provided by the WHO, assistive devices and technologies are those whose primary purpose is to maintain or improve an individual's functioning and independence to facilitate participation and to enhance overall well-being. They can also help prevent impairments and secondary health conditions.

The ***NATIFLife*** Project aims to define a ***new infrastructure*** to develop valuable solutions in the field of ***Assistive Technology.***

The general objective of the project is **to improve the quality of life of elderly and people with minor mobility impairments (e.g. at risk of fall)**, addressing their needs of **living autonomously** their domestic environments.

Specific objectives are:

Communication and networking activities
Communication to End-Users, Public Audience and Enterprises: ***info days.***
Networking activities: exchange of competences, ToK, Demand/Offer exercise, ***Hands on Training*** *for Enterprises.*

Developing a flexible integrated platform for assistive technologies
The *integrated platform* of Assistive Technology will be compliant with traditional and innovative solutions.

Strengthening of 2 research centers
The *two research centers* will be complementary reinforced to perform disruptive research in the field *two research centers* of AT and to become *a reference for Enterprises.*

The realization of two Living Labs in Sicily and Malta
The *two Living Labs* will allow design and testing innovative Assistive Technology by End-Users; implementing dissemination and training on AT.

Project PARTNERS

UNIVERSITÀ degli STUDI di CATANIA
L-Università ta' Malta
Comune di Catania
VITECO e-LEARNING SOLUTIONS
SALUPO Innovation Technology
C.T.A. HELIOS
PARAGON EUROPE

PARTICIPATION TO PUBLIC EVENTS

The NATIFLife project and the related activities was presented by the Department of Electrical, Electronic and Computer Engineering (DIEEI) of the University of Catania at the "*Walk of Life - CamminiAMO per la vita*", the event promoted by the foundation Telethon, held in Catania on April 26-28 2019.

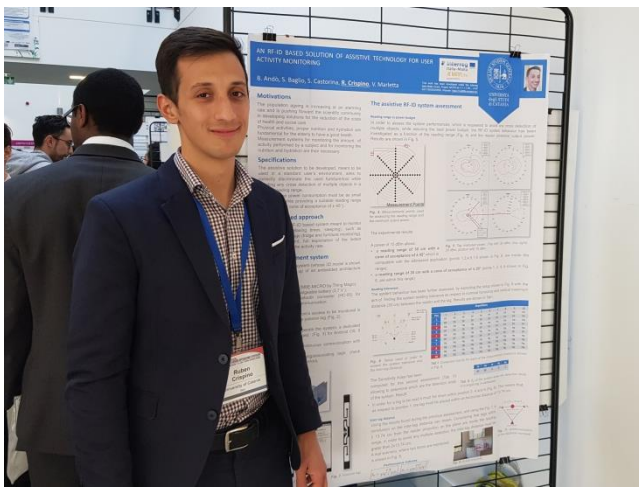
SCIENTIFIC DISSEMINATION

- AISEM 2019

The DIEEI of the University of Catania has disseminated the NATIFLife project during an oral presentation about inkjet printed sensors at the XX edition of the National Conference on Sensors and Microsystems, AISEM 2019, held in Naples (Italy) on February 11-13, 2019 .

- IEEE SAS 2019

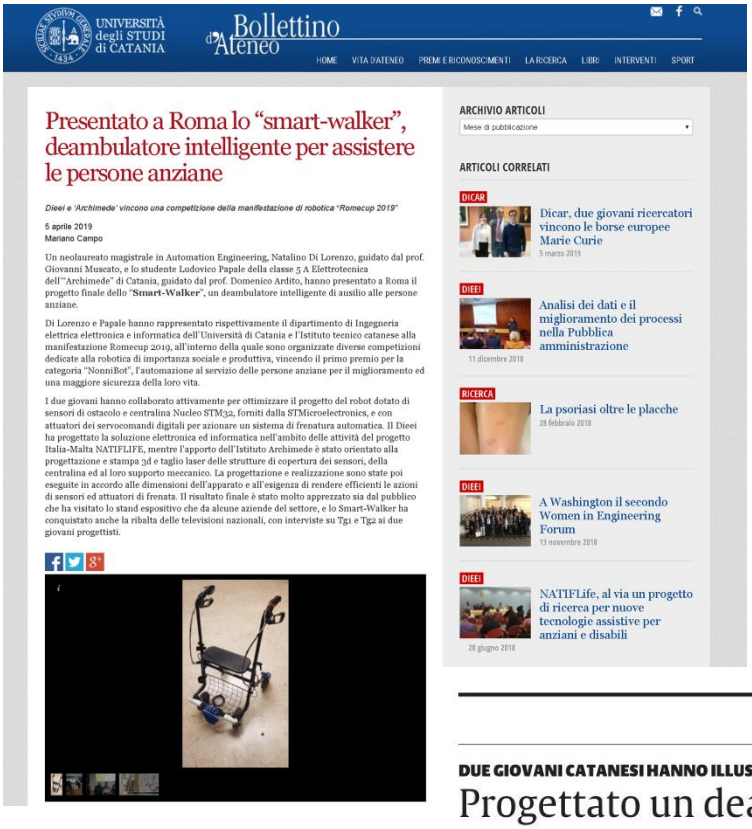
The DIEEI of the University of Catania has presented the paper titled "***An inkjet printed pressure sensor for applications in Active Ageing monitoring***" as an oral presentation in the Special Session on Flexible and Wearable Sensors, and the paper titled "***An RF-ID based solution of assistive technology for user activity monitoring***" as a poster at the international symposium on sensors applications, IEEE SAS 2019, held in Sophia Antipolis (France) on March 11-13, 2019.



SCIENTIFIC DISSEMINATION

- **Rome Cup 2019**

The "Smart-Walker" developed in the framework of the NATIFLife project by the DIEEI of the University of Catania, with a contribution of students from the industrial technical institute Archimede of Catania, was showcased at the *Rome Cup 2019*, a robotics contest held in Rome, Italy, on April 2-5 2019.



The "Smart-Walker" was **awarded** with the **first prize** in the category "**NonniBot – automation assisting senior citizens**" and was also seen at RAI TG1 and RAI TG2.

You can see the report at: *https://lnkd.in/dhysa-c*.


DOMENICA 7 APRIL

DUE GIOVANI CATANESI HANNO ILLUSTRATO A ROMA LO "SMART WALKER" INTELLIGENTE

Progettato un deambulatore per anziani

Un neolaureato magistrale in Automation Engineering, Natalino Di Lorenzo, guidato dal prof. Giovanni Muscato, e lo studente Ludovico Papale della classe 5 A Elettrotecnica dell'"Archimede" di Catania, guidato dal prof. Domenico Ardito, hanno presentato a Roma il progetto finale dello "Smart-Walker", un deambulatore intelligente di ausilio alle persone anziane.

DA SIN., DI LORENZO E PAPALE

Di Lorenzo e Papale hanno rappresentato rispettivamente il dipartimento di Ingegneria elettrica elettronica e informatica dell'Università di Catania e l'Istituto tecnico catanese alla manifestazione Romecup 2019, all'interno della quale sono organizzate diverse competizioni dedicate alla robotica di importanza sociale e produttiva, vincendo il primo premio per la categoria "NonniBot", l'automazione al servizio delle persone anziane per il miglioramento ed una maggiore sicurezza della loro vita.

I due giovani hanno collaborato attivamente per ottimizzare il progetto del robot dotato di sensori di ostacolo e centralina Nucleo STM32, forniti dalla STMicroelectronics, e con attuatori dei servocomandi digitali per azionare un sistema di frenatura automatica. Il Dieei ha progettato la soluzione elettronica ed informatica nell'ambito delle attività del progetto Italia-Malta Natiflife, mentre l'apporto dell'Istituto Archimede è stato orientato alla progettazione e stampa 3d e taglio laser delle strutture di copertura dei sensori, della centralina e al loro supporto meccanico. La progettazione e realizzazione sono state poi eseguite in accordo alle dimensioni dell'apparato e all'esigenza di rendere efficienti le azioni di sensori ed attuatori di frenata. Il risultato finale è stato molto apprezzato sia dal pubblico che da alcune aziende del settore.

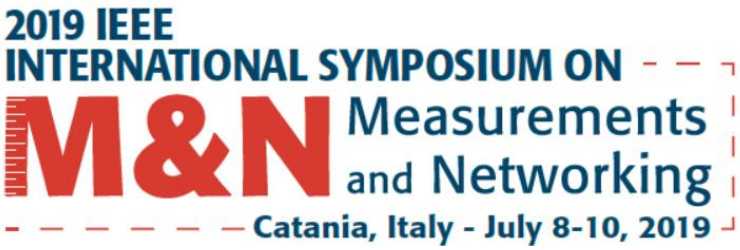
SCIENTIFIC DISSEMINATION

- **ForItAAL2019**

The **NATIFLife** project will be promoted by the DIEEI of the University of Catania at the 10th Italian Forum for Ambient Assisted Living (ForItAAL) which will be held in Ancona (Italy) on June 19-21, 2019.

To this aim a work on the NATIFLife project focused on the Smart Walker and the developed strategy for obstacle avoidance has been submitted .

- **IEEE M&N 2019**



The **NATIFLife** project will also be disseminated at the 2019 IEEE **International Symposium on Measurements and Networking (M&N)** which will be held in Catania (Italy) on July 8-10, 2019.

Researchers of DIEEI of the University of Catania and University of Malta have submitted some works related to the activities developed within the NATIFLife project.

Next upcoming events

5th-6th June, 2019, Catania-Italy

The First **Info Day** will take place at University of Catania on June 5th. The event intends to promote the assistive technologies for the independent living and the objectives of the NATIFLife project trough dedicated talks and a round table in which experts will intervene in a vibrant arena including partners, end-users, associations, caregivers, network partners, experts, institutional representatives. *The detailed agenda is available below*!

Training and Hands On Activities for the NATIFLife network will be organised on June 6th at the PDS site in Adrano (Catania). In particular the following topics will be covered: Assitive Domotics, Assistive Robotics, The NATIFLife integrated platform.

Overall event schedule

	Morning	***Afternoon***
Wednesday June 5th	Dedicated Partner meetings (University of Catania)	1st Info-Day (University of Catania)
Thursday June 6th	Training for the NATIFLife Network (PDS-Adrano)	Hands On Activity for the NATIFLife Network (PDS-Adrano)

1st Info Day

Assistive Technology for the Independent Living

June 5th, 2019

University of Catania, Italy - Aula Magna, Building 14

15.00 **Registration**

15.30 **Welcome message**

B. Andò, project coordinator - institutional representatives

15.50 **Assistive Technologies for the Independent Living**

P. Siciliano, Italian Cluster SmartLiving

16.40 Coffee Break

17.10 **The NATIFLife Project**

B. Andò, University of Catania

Reinforced Labs and Research Activity

C. De Bono, Univ. of Malta - V. Marletta, Univ. of Catania

Pilot Demo Sites: a form of Living Labs

G. Travaglianti, Helios - L. Trevisan, Paragon Europe

Integrated Platform of Assistive Technology

S. Salupo, Salupo SAS - L. Porcaro, Viteco s.r.l.

The strategic role of End-Users

G. Delfa, Social Policy Service, Municipality of Catania

18.20 **Round Table "*The impact of Assistive Technology on the Society*"**

Research on Assistive Technology

B. Andò, University of Catania

The Italian Cluster on Smart Living

P. Siciliano, Italian Cluster SmartLiving

Psychological involvement of Technology for Autonomy and Rehabilitation

S. Di Nuovo, Italian Association of Psychology

The point of view of Social Service

A. Blandi, Consorzio Zenit

19.00 **Conclusive Remarks**

NATIFLife Network

Join the network at **https://network.natiflife-project.eu** and take the following advantages from it!

Networking
Increasing Visibility, exchange of Best Practice among Stakeholders, Demand/Offer of Needs/Technology.
Developing Joint Research on innovative AT, also through the participation to research projects.

Training and Hands-On Sessions on Assistive Technology and User Centered Design.

Sharing R&D Labs Facilities
Sharing facilities and equipment to develop joint activities of industrial interest: Rapid Prototyping of wearable and flexible sensors, Smart Sensing Embedded Systems, Robotic platforms.

Exploiting Living Labs
Assessment of Assistive Technologies by End-Users involvement.

News from the network

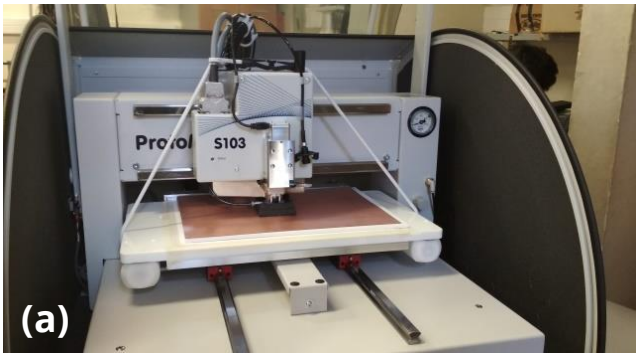
The number of network participants is growing! We are now 23.

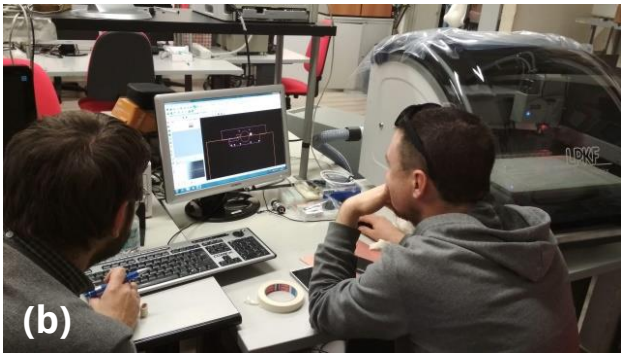
Two main groups have already created:

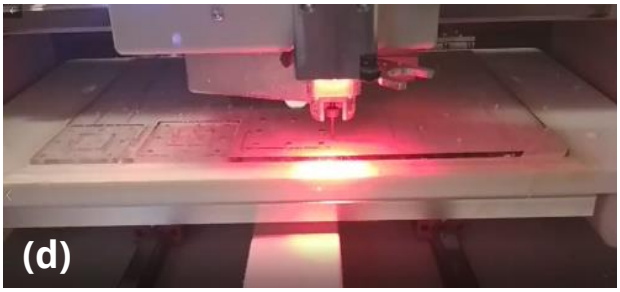
- **The NATIFLife Network**: for all the participants to the network
- **Researchers & Technicians**: dedicated to whom is interested in the technical aspects of the assistive technologies, both traditional and innovative, being developed within the project.

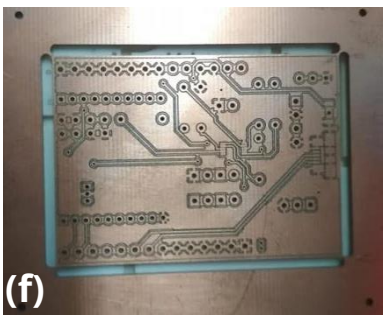
REINFORCEMENT OF THE RESEARCH CENTERS

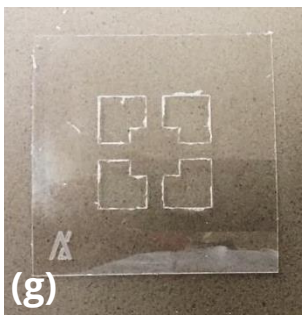
The research center in Catania has been reinforced with a CNC Milling Machine LPKF ProtoMat S103 for the rapid prototyping of PCB and micro-patterning of materials.
The machine provides new development capabilities in the design, realization and characterization of flexible and wearable sensors as well as smart multi-sensor systems.











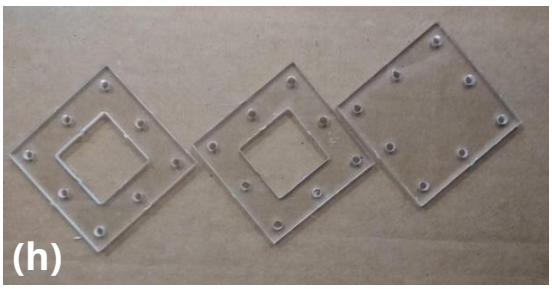


Fig.: (a) the CNC Milling Machine installed at the Research center in Catania; (b) researchers at work using the machine; (c & d) the machine working on two different substrate materials; (e & f) the NATIFLife logo and a PCB realized onto a FR4 substrate with a milling process; (g & h) some examples of fixtures realized onto a polycarbonate substrate with a 2.5D process.

NEWS FROM THE RESEARCHERS

Research activities @ University of Catania

Main results yet achieved by researchers at DIEEI – UNICT:

- A RFID technology based solution for the unique identification of the user interacting with the environment (fornitures, household appliances) aimed at the user habits monitoring.
- A flexible solution exploiting a matrix of inkjet printed strain sensors for the monitoing of prolonged user inactivity.
- An assistive device for mobility support (smart walker) and a dedicated obstacle avoidance algorithm.

Research activities @ University of Malta

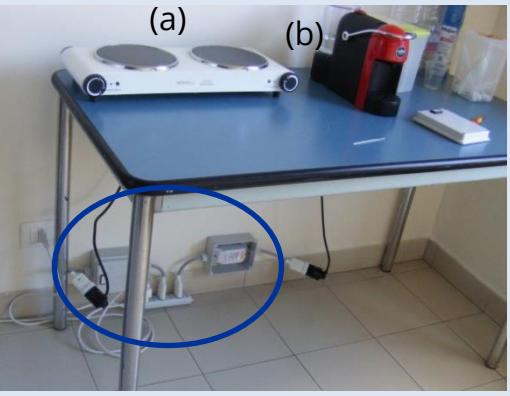
Researchers at UNIMalta are developing a new system based on depth sensor cameras for monitoring and localising elderly persons living in home environments. The data captured will be processed using computer equipment on-site and report location and alerts to the integrated NATIFLife cloud solution. This data can be used by relatives and carers to remotely monitor the activity of the elderly throughout the day. Moreover, the system will be able to issue alerts in real-time if abnormal behaviors, such as a fall, is detected.
In the last months the depth sensor cameras arrived at the research labs of the University of Malta and work is on-going to determine algorithms that will be used for the NATIFLife project.

The figure shows one of the depth sensor cameras capturing the image and the depth data of a number of objects. The depth data, which is the data that will be used in NATIFLife to guarantee privacy, is the image on the right side of the laptop screen.

Guided tours of end-users at both the Living Labs in Adrano and Malta are in progress. This first run of tours are aimed at vision of the living labs and evaluation of the degree of satisfaction.

Domotics solutions installed at the PDS in Adrano

Traditional domotics have been installed at the Living Lab in Adrano to be used in a conventional and innovative way for the sake of user habits and user environment interaction monitoring.



Household appliances use monitoring systems : (a) electric hot plate; (b) coffee machine; (c) television.

WiFi wall touch switch.

Fridge and food storage access monitoring systems.

Many meetings, involving all or some of the project partners, aimed at the definition of specific technical aspects, solutions, organization of guided tours of the living labs etc., have been conducted in these months.

Second Review Meeting, Catania, June 4, 2019

The **second project review meeting** will be held at the DIEEI of the University of Catania on June 4th. Partners will also be engaged in **Hands On activities** at the PDS in Adrano (Catania).

Event schedule

Tuesday June 4th	
Morning	***Afternoon***
2nd Project Review Meeting (University of Catania)	Project Review Meeting and Hands on Activity for Partners (PDS-Adrano)

Join the NATIFLife Network!

Explore your own advantages

www.natiflife-project.eu

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For information contact us at: **info@natiflife-project.eu**