Profile View

Details

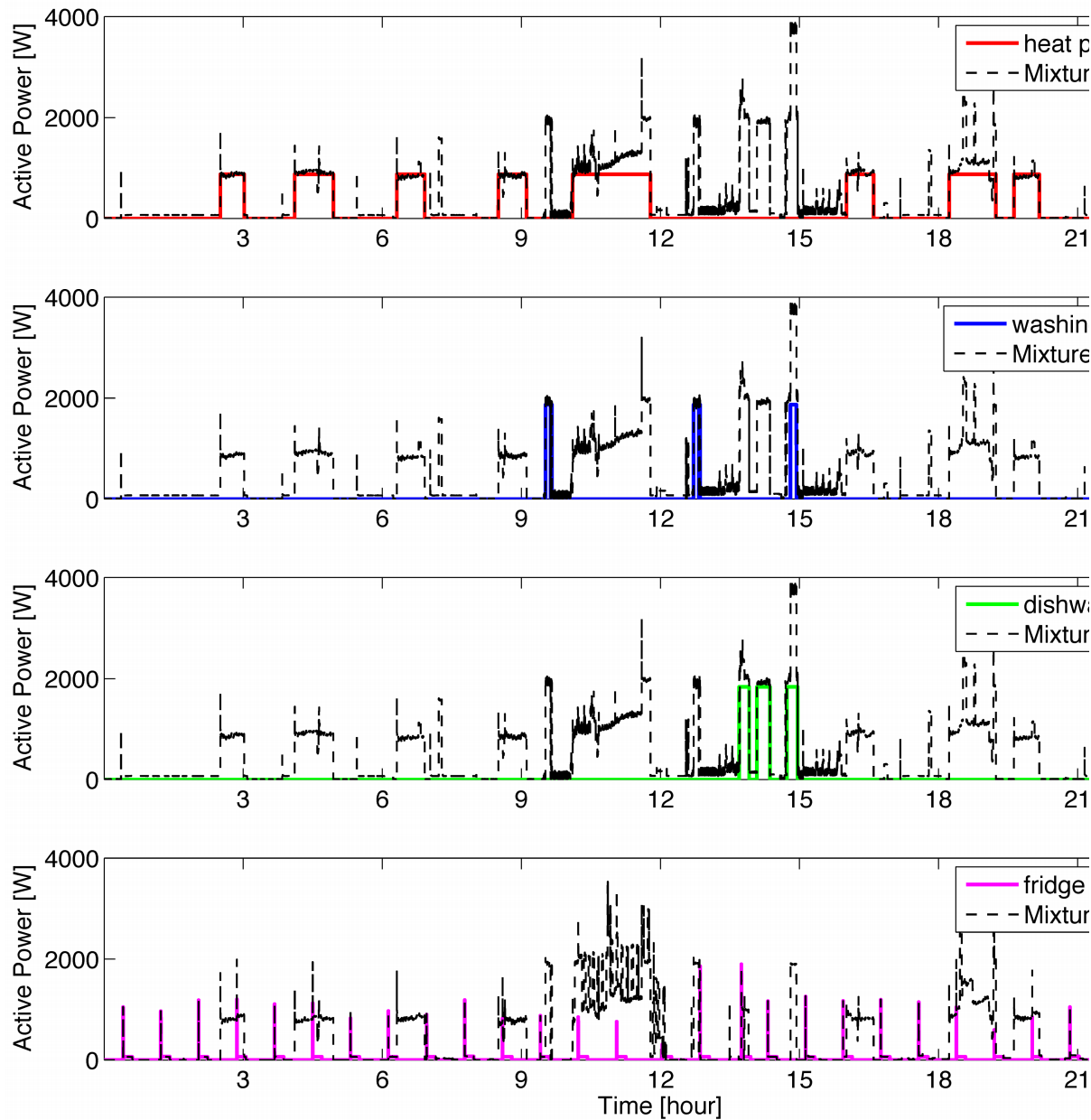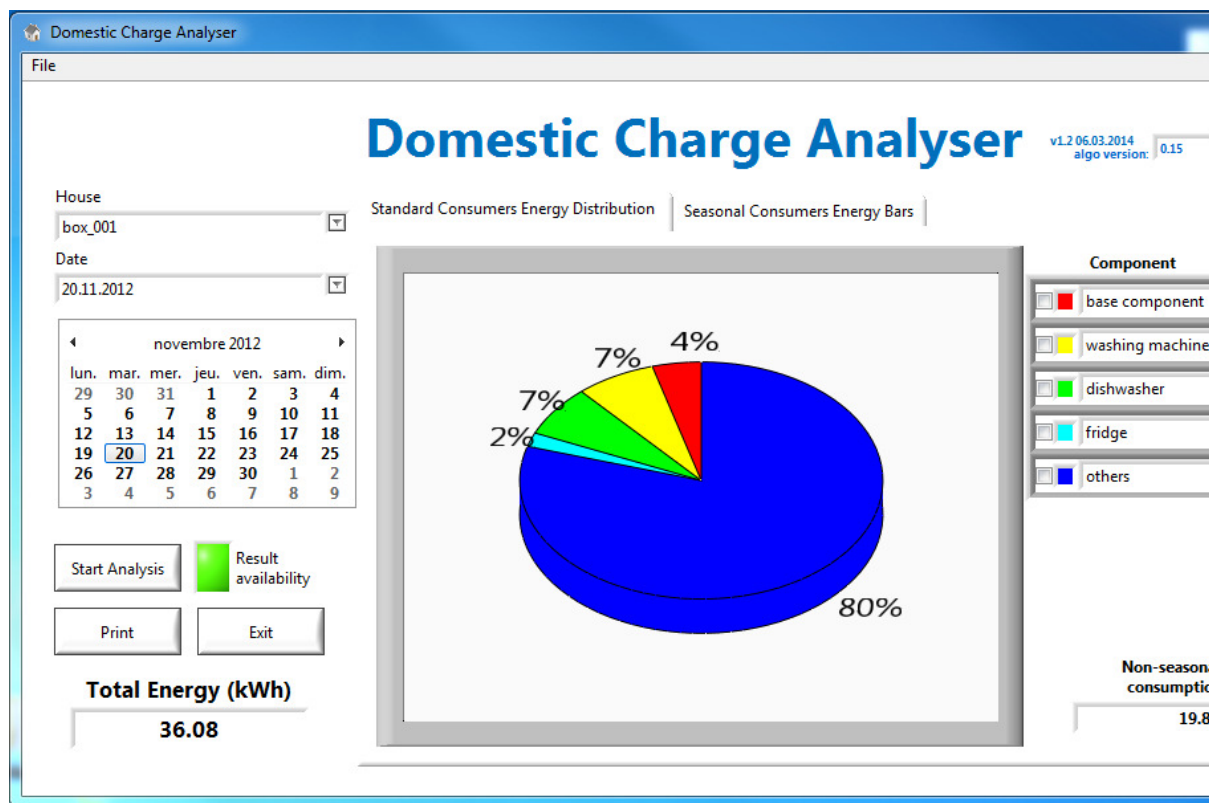|	
Title:	Algorithm for analyzing the electricity consumption of the appliances of an household from a single point of measurement
POD Reference:	TOCH20150216001
Summary:	A Swiss private applied R&D center has developed a novel algorithm for non-intrusive appliance load monitoring (NILM) of domestic buildings. It automatically separates the measurement signal of the total power consumption of a household into the different appliances. They are seeking partners with expertise in monitoring electrical consumption & the development of mobile apps and electrical sensing equipment for research and cooperation agreements to integrate the technology into their system.
Description:	Non-intrusive load monitoring (NILM) is a technique that determines the load composition of a household, i.e. the activity of the individual appliances which constitute the load, through a single point of measurement, e.g. the main electrical service entry point of the home. This technique has the great advantage to not require installing meters on each individual appliance. The proposed approach aims at reducing electrical usage of households by providing to the end-user a detailed description of its electrical consumption, allowing him to understand and modify its consumption habits accordingly. The method can also be used by the energy supplier in order to predict the local electrical consumption to better plan energy requirements and provision. A model for five different types of appliance was implemented: - the fridge - the heat pump - the base component - the washing machine and - the dishwasher And a graphical interface to display the estimated energy of each appliance, e.g. with a pie chart, was also developed (see figures). The algorithm was evaluated on a database of aggregated load signals, obtained from a low-frequency (1 Hz) acquisition system able to measure the three phases of a standard household, as well as on a database of synthetic signals obtained by an appliance simulator. Experiments on real and synthetic mixtures showed very promising results, with an energy estimation error less than 1% for the main contributors of the household.
Advantages and Innovations:	This non-intrusive load monitoring (NILM) technique can determine the load composition of a household, i.e. the activity of the individual appliances which constitute the load, through a single point of measurement, e.g. the main electrical service entry point of the home. • Cheap and easy to install because it only requires a single point of measurement as opposed the classical approach which will require installing meters on each individual appliance. • The algorithm can work at a low sampling rate (1Hz) and thus do not require expensive high sampling rate devices
Stage of Development:	Prototype available for demonstration
IPR status::	Patent(s) applied for but not yet granted
Comments Regarding IPR Status:	applied for patent in CH and EU
Profile Origin:	Regional R&D programme

Attachments

Fig_2.png

Fig_1.png

Keywords

Technology Keywords:	001002023 Internet of Things 001005009 Signal Processing 004008 Energy efficiency 009001004 Electrical Technology related to measurements 010002004 Environmental Engineering / Technology
Market Keywords:	002006004 Data processing, analysis and input services 002007009 Home 006005013 Distributed power and grid connection 006008001 Metering and monitoring 006012001 Energy for private/domestic housing
NACE Keywords:	M.72.1.9 Other research and experimental development on natural sciences and engineering

Partner Sought

Type and Role of Partner Sought:	The Swiss R&D center is looking for industrial partners that will be interested by our technology in order to integrate it into their system. Partners sought have the technology and expertise in the development of applications for tablet and smartphones or web applications, specialized in monitoring electrical consumption, energy efficiency, and the development of electrical sensing equipment such as smart meters in order to perform non-intrusive load monitoring. The tasks to be performed by the partner sought: Integrate the offered technology into their system, or merging a similar and complementary technology into a more powerful one.
Type and Size of Partner Sought:	>500 >500 MNE 251-500 R&D Institution SME <10 SME 11-50 SME 51-250 University
Type of Partnership Considered:	Research cooperation agreement Technical cooperation agreement

Client

Type and Size of Client:	R&D Institution
Year Established:	1984

Already Engaged in Trans-National Cooperation:	Yes
Languages Spoken:	English French
Client Country:	Switzerland

Dissemination

Sector Group:	ICT Industry and Services