Towards accessible sustainable architecture, source of autonomy

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Keywords: Towards universal; Accessible architecture; Durable; Source of autonomy

The law of February 11th, 2005 revolutionizes the consideration of the disabled person in our French society. It applies to any type of disability, even crippling situations, by creating statutory obligations in a consideration of accessibility in the widest sense of the term, considering the entire chain of movement. Though the law was much awaited, many obligations it instituted remain to be fulfilled particularly in the field of the construction. The requirement for accessibility by January 1st, 2015 will undoubtedly not be achieved. Nevertheless, shouldn’t we see in this law as an asset rather than an obligation? Architecture, the primary art, has always had for its essential function to protect human being and as such cannot do without an analysis on the wide variety of persons constituting the human population, and in particular, the disabled person who, at any age of life, can experience an impairment in physical, or even cognitive integrity. Taking disability into account in the architecture of tomorrow, with for objective restoring autonomy of dependent persons, whether elderly or disabled, makes architecture a source of better life and greater welfare, but also of higher profit, despite the fact that may professionals still consider this new approach as more restriction on construction. My contribution to this congress is thus to put forward this ideal of a universal architecture, based on new criteria, a new source of desire, pleasure and shared happiness. I will focus on essential points such as for the heating of the disabled, More and more testing laboratories are developing for the validation of mic models have been imagined, which will finally allow assistive robotics to grow up.

Rodolphe Gelin is head of collaborative projects at Aldebaran Robotics since 2009. Previously he had been a researcher in robotics at CEA (French Atomic Energy Commission) for 20 years.


Towards a non-standard project: Conception of a rehabilitation center

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Rehabilitation centers are often last on the list of healthcare construction projects. General contractors and conceptors are more interested in acute-care or surgical centers where “high-tech” installations take priority over other dimensions, including patient-centered concerns, which nevertheless constitute the heart of the project. These projects are similar to industrial projects where the ongoing process of medical care predominate over the human (patient and caregiver) aspect. People stay in acute-care establishments for only a short period during which time the system takes over completely. Considering its mission, the rehabilitation center must be reinterpreted and reorganized as a differentiated space for specialized activities, for readapting to life after returning home. The rehabilitation center is thus a transitional space, which requires a specific programation around the notions of utilization, flow, rhythms, mobility, light, atmosphere, and perceptions. The aesthetic dimension often neglected or considered as an anecdotal superlative, should be an integral part of this type of project, allowing the patient to focus on something other than his/her own suffering body. An adapted conceptual approach proposes an analysis of different scenario for using a unique space, in relation with the environment, and with the goal of producing a combined, balanced and functional project fulfilling its mission of patient care and rehabilitation.


State of the art and perspectives in assistive robotics

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Keywords: Robotics; Assistance to elderly person; Cognitive assistance

Since the end of the 80’s, researchers in robotics have proposed the use of the robots to assist disabled people. The first applications consisted in compensating the failing functionality (generally handling) of a disabled person by a robotized function: the arm of the robot replaces the disabled person’s arm. While the principle is rather simple, the implementation faces practical problems that researchers quickly identified and sought to solve: how to give a simple and intuitive control of a mechanics as sophisticated as a robot to a person who does not have any expertise in the field. Researchers then devoted much work to the interface between the disabled person and the robot to improve the effectiveness of this team. Satisfactory solutions were reached but the rise of assistive robotics for disabled people then ran up against a second problem: the industrialization and the distribution of products whose manufacture and maintenance still require competences beyond what one classically found in industry. Furthermore the economic model of such a system was not obvious enough so that companies would take the risk to launch such innovations. Assistive robotics arrived at a dead end. But at the beginning of the new century, the ageing of the population put forward new needs for assistance that new types of robots could fulfill. For elderly people, whose autonomous life becomes increasingly difficult due to problems of perception or memory for example, the robot can provide cognitive assistance which will enable them to live longer at home in better conditions. These robots, whose complexity can be very variable, can be produced at affordable prices and viable economic models have been imagined, which will finally allow assistive robotics to grow up.

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Universal accessibility: Domotics

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Abstract not provided.


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Accelerating the development of products and services to offset visual impairment

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According to the WHO, there are 1.8 million visually impaired people living in France.

In the absence of regenerative therapy, the diseases of aging are irreversible. These age related illness which develop individually in different ways from one case to another, have incited industrial companies to work in partnership with patient associations and university laboratories to develop palliative solutions to compensate for visual deficiency. The ultimate goal is to improve the quality of life and the autonomy in everyday life: mobility, accessibility and safety.

The February 2005 law, imposing unilateral access to public spaces becoming mandatory in 2015, gives new importance to innovation on services for the disabled. More and more testing laboratories are developing for the validation of
new products and above all to ensure that they are compatible with the needs of their eventual consumers.


CO10-002–EN

Experience of the Angers sensorial platform for auditory and visual deficiencies

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No abstract provided.


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The school of autonomy: Experience of the May institute

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No abstract provided.

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Cognitive developmental impairments and learning to drive

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Within the background of developmental impairments, few studies have demonstrated what abilities are necessary to obtain a driver’s license. Some disabled patients learn driving skills directly from a driving school with no specialized training in teaching the disabled, and without prior assessment. For patients with developmental impairments, as for patients with cognitive impairments, multidisciplinary assessment is necessary before deciding on making the decision to drive and accepting the associated financial burden. Before a real try at learning to drive, an initial assessment, especially a neuropsychological assessment, can evaluate the speed of information processing, visuospatial, attention and executive abilities, as well as praxis and gnosis functions and behavior. Language and long-term memory assessments are notably necessary in a developmental impairment background. Praxis assessment is important because of the frequency of this impairment in this context. It is very important to assess verbal and visual episodic memory skills and learning and language abilities to estimate the probability of passing the driving regulations examination. At the Lille university hospital, a protocol of multidisciplinary assessment of driving abilities is organized during three days spread over one week. In 2009 and 2010, 47 patients with cognitive impairment were assessed with a driving simulator before starting real driving lessons. Among these 47 patients, 13 patients had developmental impairments. For eleven of them (85%) a favorable recommendation was given. The two patients, for whom an unfavorable recommendation was given, had already begun driving lessons. Only one patient did not start driving learning after assessments. To talk about driving and to propose pertinent assessments available on a local level is an important approach in a context of disability as part of the follow-up care for patients presenting cognitive developmental impairment.


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Location-based services: Technology and applications

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Location-based services are enabled by a technology, which allows to localize mobile phone end-user to propose targeted services. Today the main French operators (SFR, Telecom Bouygues, Orange) propose these types of services. There are several location technologies:

- CellId: bases on mobile networks cells (location precision of 500 m in town and up to 2.5 km in countryside but accessible on all the mobile phones). Around the cellId based technology, other technologies allow to strengthen the precision of the location (for example the triangulation);
- “Enhanced Assisted” GPS: location by satellites, associated with correction data, for a precision from 5 to 20 meters. This type of location requires nevertheless to be equipped with a mobile phone supporting the assisted GPS technology. These location technologies are offered on platforms integrated into operators’ networks, which offer to the subscribers, through the management of their authorizations, to be localized, a respect of their private life is the main requirement for the development of this type of services.

The applications proposed today by the operators cover various domains:

- localized parental control: allows parents to know where their children; are systems of tracking allow to make sure for example that a child will not go out of an established route. An example of this type of service is OOTAY, offered by most of the operators. This type of application can also address old persons who have difficulties finding a way. They can be localized by close relations or localize themselves;
- navigation;
- management of car fleets or the other materials through equipments provided with SIM cards;
- convenience services: allow the subscribers to find services near the place where they are: pharmacy, gas station, cinema etc.;
- geomarketing: access to advertisements or promotional operations near the location etc.

The purpose of this study was to assess the use of a positioning system by people with Alzheimer disease or dementia. This system is composed of bracelets equipped with GPS, connected to a remote-assistance service. First, a geofencing area, called “Safe Zone”, is determined, representing the location where the user is able to go safely. If the user leaves this Safe Zone, the remote-assistance service receives an alert and starts a retrieval procedure. The time of the alarms is automatically recorded, as well as the comments of the remote-operator about the follow-up of the alerts. “Leaving Safe Zone” (LSZ) alarms are considered as an indication of wandering.

This system was tested by 181 subjects with Alzheimer disease and related dementia (99 people living at home and 82 people living in specialized residences) and their caregivers from January to December 2010. The analysis of the data revealed that 77% of the alerts received concerned LSZ. Among these alerts, 53% were elicited in safe conditions (accompanied or planned outings), and 15% were followed by the retrieval of the person. Finally, many more alerts were recorded in the Home group than in the Residence group, as persons at home were more able to go out than people in residences. Nevertheless, after normalization of the proportion of LSZ alarms, we observed that, proportionally, an equivalent number of persons were retrieved in both groups.

These results suggest that such a GPS-based Positioning System could offer more autonomy in safe conditions for people living in residences. It might even help avoid placing in residence persons whose only problem is wandering, by guaranteeing them a safe environment. Nevertheless, complementary analyses, which are being conducted in a larger-scale project called ESTIMA (French acronym for: Sociological and ethical Assessment of Information Technology for the Localization of people with Alzheimer’s disease who wander) are essential to extract eventual significant differences concerning the wandering in residence versus home residences. We thus plan to bring other important observations for improving medico-social