

Specifiche Premio Accessibilità Sostenibilità Qualità della Vita



Nome Prodotto Tactile 3d Maps

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Descrizione del prodotto

Tactile 3D Maps is a framework for conventional 2D map access from the blind and the visually impaired. The framework supports: a) extraction of the semantic information directly from the map images b) translation of the visual information to haptic and audio representations and c) presentation to the visually impaired users using virtual reality interfaces (i.e. virtual environments, haptics and audio). During the latest years cartography has been greatly advanced with the GPS being the tip of the iceberg. Unfortunately, up to date, common maps are perceived only by using the visual modality. Therefore, special population categories such as the visually impaired, cannot access this information. Haptic interaction is especially important to populations with disabilities such as the visually impaired because the tactile modality provides them with one of the most important sources of information that they use to perceive the world. Tactile 3D Maps focuses on transforming visual data to haptic and aural representations. The resulting haptic-audio representation of the map can be used for navigation and path planning purposes. The visually impaired users are able to navigate in the generated pseudo-3D map using a haptic device, while audio feedback regarding the street names is also provided. In particular, when a user navigates in the environment, a force is applied by the haptic device that the user grasps and which corresponds to the reaction force of the potential collisions of the user's hand and the 3D virtual environment of the map. Experimental results illustrate that Tactile 3D Maps is considered very promising for the visually impaired users and has been reported to be a very fast means of generating maps for the visually impaired when compared to other traditional methods like Braille images.

Materiali Operating System: Windows XP, CPU Pentium IV 3.2 GHz, Memory: 1GB RAM, HDD Space: 100MB Free, Standard Soundcard, NVIDIA GeForce 6000 , 1x Parallel port , PHANTOM Desktop™ Haptic Device

Dimensioni Force feedback workspace :~6.4 W x 4.8 H x 4.8 D in.> 160 W x 120 H x 120 D mm., Footprint (Physical area device base occupies on desk) : 5 5/8 W x 7 1/4 D in.~143 W x 184 D mm., Weight (device only) :6 lbs. 5oz., Range of motion :Hand movement pivoting at wrist

Tecnologia / Funzionamento

The framework utilizes algorithms for the segmentation of the map images using morphological filters that are able to provide indexed information on both the street network structure and the positions of the street names in the map. Next, off-the-shelf OCR and TTS algorithms are utilized to convert the visual information of the street names into audio messages. Finally, a grooved-line-map 3D virtual reality representation of the map network is generated. The visually impaired users are able to navigate into it using a haptic device. While navigating, audio messages are displayed providing information about the current position of the user (e.g. street name, cross-road notification and so on).

Benefici per l'ambiente

Benefici per la persona

The goal of the Tactile 3D Maps framework is to provide the visually impaired with an easy to use means of accessing conventional 2D civil maps. The framework and its applications aim at improving navigation potential and mobility independence of people with visual impairments, thus ameliorating their productivity, socialization and general quality of life. Financial benefits also arise by the reduction of the need for care personnel through the introduction of such assistive technologies. Consequently, such research proves to be very useful and important for a large proportion of the population.

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