ISWC 2004: EIGHTH IEEE INTERNATIONAL SYMPOSIUM ON WEARABLE COMPUTERS: PROCEEDINGS pdf

1: Thad Starner Publication

CSDL Home I ISWC Eighth International Symposium on Wearable Computers () Arlington, Virginia. Oct. 31, to Nov. 3,

The maps and guidelines are free to use, and are organized by different sensing needs and human body affordances. Clint Zeagler and the Georgia Tech Wearable Computing Center retains the copyright to all images and diagrams on this page. Use with citation and photo credit. Items extending beyond this distance from the body might take a period of time for a person to adjust and account for the object within their personal self-size envelope. Second International Symposium on Wearable Computers Development of a commercially successful wearable data collectionsystem. Human Factors In Design. This body map shows the amount of weight, or pressure that can be placed on the area before the pressure becomes a discomfort. If a device needs a large battery to last a long time or because it needs large amounts of power to function place the large battery on the waist. If the wearable needs to be located on a different part of the body for use then consider distributing the power from the area of use. Finally consider distributing battery cells instead of using one large battery. Density, or heaviness compared to size, in combination with other material aspects such as metallic textures are perceived to be luxurious. We are after all, biological creatures, with physical bodies, arms, and legs. Norman Use weight where appropriate to create a positive experience with the wearable technology object or garment. Age, sex, medical conditions and other factors may affect the way in which pressure affects mobility. Georgia Institute of Technology. This body map shows the best places to put wearable devices on the body, where they will be the least obtrusive and cause the least amount of body motion impedance. This means that a discomfort from an inappropriately placed wearable device will not be felt, and could cause harm from extended wear. A system of notation and measurement for space suit mobility evaluation. For sensing whole body motion, and limb motion accelerometers, gyroscopes, and magnetometers can be used at locations indicated. For sensing joint movement flex or stretch sensors can be used at locations indicated. Force and explain the impact of movement. If trying to capture movement within an environment, magnetometers for direction and barometric pressure sensors for elevation change may be used. Combinations of sensors in lower and upper limb configurations can aid in more defined movement capture such as bending of joints, and gate. These sensors should be placed across the joint so the movement of the joint cause the sensor to bend. When sewn into form fitting garments properly stretch sensors can give most of the same information bend sensors can, without the added rigidity from the sensor housing. Force sensor placed in glove fingertips can tell tapping and pressing. This information combined with other sensing information can give a very complete picture of body movement. Because the movement sensing can be complete and complex, but also can be done without respect to location there is a level of privacy. Where as if a person is in rehabilitation from knee surgery, perhaps a movement sensor might be used to see if they are complying with their exercises. Capturing human motion using body-fixed sensors: Outdoor measurement and clinical applications. Computer Animation and Virtual Worlds. Temporal feature estimation during walking using miniature accelerometers: Design research methods to understand user needs for an etextile knee sleeve. Wearable sensor badge and sensor jacket for context awareness. Third International Symposium on Wearable Computers. Corrective sonic feedback for speed skating: Implementation of a real-time human movement classifier using a triaxial accelerometer for ambulatory monitoring. Measuring distance walked and step count in children with cerebral palsy: An evaluation of two portable activity monitors. Evaluation of a fall detector based on accelerometers: Medical and Biological Engineering and Computing. Analysis of nighttime activity and daytime pain in patients with chronic back pain using a self-organizing map neural network. Journal of Clinical Monitoring and Computing. Fundamentals, Implementation and Applications. Transactions on Biomedical Engineering. Acceleration patterns of the head and pel v is when walking on le v el and irregular surfaces. Age-related differences in walking stability. Musical Interaction with Hand Posture and Orientation: A Toolbox of Gestural Control Mechanisms. May , 21â€” Ambulatory system for human motion analysis using a kinematic sensor: Monitoring of daily physical activity in the elderly. VTAMN--a smart clothe for ambulatory remote monitoring of physiological parameters and activity. Validation of the AMP monitor for assessing energy expenditure of free-living physical activity. Classification of waist-acceleration signals in a continuous walking record. Medical Engineering and Physics. July , â€” A survey of glove-based input. Detecting absolute human knee angle and angular velocity using accelerometers and rate gyroscopes. A review of accelerometry-based wearable motion detectors for physical activity monitoring. Prototype Wearable for Analyzing Archery Release. Active touch represents the exploratory action of touching. This is also true for interfaces on the surface of wearable devices. Concavities on top of buttons might lend themselves to a pushing type active touch investigation. Ridges on the circumference of cylinders might lend themselves to turning. Expenditures at an angle to a plane might afford a flick, or leverage. Dreyfus lays out shapes and sizes for controls in his book [7]. Thus interfaces should be designed with robust multisensory feedback. Where as one person might feel a click of a button through tactile means, others who cannot might require an audio cue or a visual cue to know that a selection has been made. Observations on active touch. Supporting multitasking with wearable tactile displays on the wrist. Handbook of Perception and Human Performance. What utility is there in distinguishing between active and passive touch? The Design of Everyday Things. Towards a glove-mounted tactile display for rendering temperature readings for firefighters. From Sportswear to Spacesuits. Average distance in two-point discrimination sensitivity test on body locations. Multimodal feedback is important; designers need to create wearable devices that can prompt users with a variety of different abilities. Vibration and haptic alerts can aid those with visual impairments when acoustic feedback is inappropriate. Mobile Music Touch has shown that rehabilitation with the vibrating piano gloves not only taught participants to play piano, but also improved their sensation and dexterity [28]. Human Perception and Performance 14 1: Brewster, and Helen C. World Haptics Conference, 0â€”4. Tan, and Charles Spence. The State of the Art after 50 Years. Teleoperators and Virtual Environments 16 6: Arpajian, and Timothy F. The Effects of Number of Stimulators. The Sciences and Engineering. Vibration Stimulus in Hand Rehabilitation. Effects of One- and Two-Site Stimulation. This body map shows where to place wearable technology which adds heat through operation and added bulk and material. This map focuses on a devices tendency to raise overall body temperature; however, tissue on the body can burn at any location is exposed to enough heat over time. Again if a person cannot feel a localized heat source at the body location where the wearable is placed, even lower temperatures over longer time periods can cause significant burns. Skin blood flow in adult human thermoregulation: Heat transfer to blood vessels. Journal of biomechanical engineering.

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2: Wearable Computers

ISWC '04 Eighth IEEE International Symposium on Wearable Computers October 31 - November 3, in Arlington, VA (Washington DC metro area).

The use of wearables for specific applications, for compensating disabilities or supporting elderly people steadily increases. By this definition, the wearable computer was invented by Steve Mann , in the late s: Thorp and Claude Shannon built some computerized timing devices to help them win at a game of roulette. One such timer was concealed in a shoe and another in a pack of cigarettes. Various versions of this apparatus were built in the s and s. Detailed pictures of a shoe-based timing device can be viewed at www. Thorp refers to himself as the inventor of the first "wearable computer" [15] In other variations, the system was a concealed cigarette-pack sized analog computer designed to predict the motion of roulette wheels. The system was successfully tested in Las Vegas in June , but hardware issues with the speaker wires prevented it from being used beyond test runs. Programmable calculators followed in the late s, being somewhat more general-purpose computers. The HP algebraic calculator watch by Hewlett-Packard was released in Collins in , converted images into a point, inch square tactile grid on a vest. In , Steve Mann designed and built a backpack-mounted based wearable multimedia computer with text, graphics, and multimedia capability, as well as video capability cameras and other photographic systems. Mann went on to be an early and active researcher in the wearables field, especially known for his creation of the Wearable Wireless Webcam , the first example of Lifelogging. It was an early smartwatch , powered by a computer on a chip. The Hip-PC included an Agenda palmtop used as a chording keyboard attached to the belt and a 1. Later versions incorporated additional equipment from Park Engineering. Users would wear a Private Eye display over one eye, giving an overlay effect when the real world was viewed with both eyes open. KARMA would overlay wireframe schematics and maintenance instructions on top of whatever was being repaired. For example, graphical wireframes on top of a laser printer would explain how to change the paper tray. The system used sensors attached to objects in the physical world to determine their locations, and the entire system ran tethered from a desktop computer. As with the Toronto system, Forget-Me-Not was not based on a head-mounted display. Also in , DARPA started the Smart Modules Program to develop a modular, humionic approach to wearable and carryable computers, with the goal of producing a variety of products including computers, radios, navigation systems and human-computer interfaces that have both military and commercial use. In July , DARPA went on to host the "Wearables in " workshop, bringing together industrial, university, and military visionaries to work on the common theme of delivering computing to the individual. The symposium was a full academic conference with published proceedings and papers ranging from sensors and new hardware to new applications for wearable computers, with people registered for the event. Bruce H Thomas and Dr. Wayne Piekarski developed the Tinmith wearable computer system to support augmented reality. This work was first published internationally in at the ISWC conference. Poma stood for Personal Media Appliance. The project failed for a few reasons though the top reasons are that the equipment was expensive and clunky. The cameras can be worn atop the head or around the wrist and are shock and waterproof. GoPro cameras are used by many athletes and extreme sports enthusiasts, a trend that became very apparent during the early s. In the late s, various Chinese companies began producing mobile phones in the form of wristwatches, the descendants of which as of include the i5 and i6, which are GSM phones with 1. Bluetooth lead to more various interfacing under the WPAN wireless personal area network. It also led the WBAN Wireless body area network to offer new classification of designs for interfacing and networking. The 6th-generation iPod Nano , released in September , has a wristband attachment available to convert it into a wearable wristwatch computer. The development of wearable computing spread to encompass rehabilitation engineering , ambulatory intervention treatment, life guard systems, and defense wearable systems. Once paired, it becomes an additional remote display and notification tool. Google Glass launched their optical head-mounted display OHMD to a test group of users in , before it became available to the public on May 15, On January 15, , Google announced that it would stop producing the Google Glass prototype but would continue to develop the product. According to Google, Project Glass was ready to "graduate" from Google X , the experimental phase of the project. The device is attached to the temple and to the back of the neck with an adhesive strip. As small as a button, it features a 6-axis accelerometer , a DSP sensor hub, a Bluetooth LE unit, and a battery charge controller. On April 24, , Apple released their take on the smartwatch, known as the Apple Watch. The Apple Watch features a touchscreen, many applications, and a heart-rate sensor.

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3: Center for Visual and Neurocognitive Rehabilitation: Home

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In wearable computing scenarios, hand positioning and tracking is particularly difficult due to complex background, lighting variation and image dithering caused by head movement. This paper proposes a robust hand tracking method for gesture-based interaction of a wearable computer with a visual helmet. Furthermore, the algorithm can recognize the current hand gesture and automatically switch between multiple well-defined gesture templates in the tracking loop. The experimental results show that the proposed algorithm worked well in dynamic and complex background in real time. Introduction Wearable computing has received more attention as the rapid progress of computer hardware and software. The natural and fluid human-computer interaction is one of the most promising modes for wearable computing. A head-mounted visual sensor could provide a wearable computer with a channel to sense the world from a first person perspective. By the visual interface, the wearable computer is able to observe and understand the intention and context of wearers, and then assists them with perception, computation, and decision. The head-mounted visual technique provides a better choice to interact with wearable computers. Hand gesture, lip reading, eye gazing and facial expression are suitable interfaces for wearable computers. In recent years, a number of gesture-based interfaces have been developed for wearable or mobile computing systems []. It is a gesture interface primarily designed for home automation control and medical monitoring. The performance of the prototype system proved excellent in preliminary experiments. Generally, systems based on active infrared pose no serious problem with regards to image processing, but they do not work well under direct sunlight; while systems based on ultrasonic and inertial orientation are still expensive for most applications. Vision-based technology not relying on active infrared provides the most generally applicable and promising solutions for gesture-based interaction of wearable computers. However the vision-based methods also pose the largest technical challenges. These methods in [] for positioning and tracking human hands are based on skin color segmentation, depth map segmentation, and hand shape information. Most of them are sensitive to lighting variation and complex background. Particularly, in the case of wearable modes, the head-mounted cameras are not stationary while the hand is moving to form gestures, which introduces image jitters and dramatic changes in the unrestricted background and the lighting conditions. Most of existing hand tracking methods cannot deal with the problems. However the methods in [2,3] are sensitive to lighting variation as a result of using color information. The probability density function PDF of the hand contour distribution in image is represented by a randomly generated sample-set, which is non-Gaussian and able to represent simultaneous alternative hypotheses in cluttered background [11]. Furthermore, the algorithm generates large numbers of random samples near the predicted position at each step, which improves robustness of the tracker in the presence of ego-motion. In this paper, a robust hand tracking method is proposed for gesture-based interaction of a wearable computer with a visual helmet. In addition to performing hand tracking, the proposed algorithm is able to recognize the current hand gesture and automatically switch between multiple well-defined gesture templates in the tracking loop. The most of gesture recognition algorithms [1,10] identify gestures on a single image without using the results of hand tracking. In order to put gesture-based interaction into practice, integration of tracking and recognition should be done. Our method can bridge the gap between tracking and recognition, simultaneously track hand and recognize gestures. We adopted learned dynamical models and pre-defined gesture templates together with visual observation, to propagate the sample-set over time. As can be seen in the experimental results, the tracking performance is robust to complex and dynamic background. The recognition rate is also fine in clutter. Notwithstanding the use of stochastic methods, the algorithm runs in real time with the help of the powerful vision servers. System overview There are a small number of existing wearable vision systems, such as Weavy [12] and WeRo [13]. We also developed a wearable vision system, called WEVIS, which aims at providing a gesture-based interface between a wearer and a wearable computer. The system can run different vision tasks in real time with the help of the powerful vision servers. Overview of the system framework diagram Figure 2. Wearable Client Visual helmet. Wearable computer with WLAN card: As shown in Figure 2, the wearable client is composed of four parts: CMOS stereovision heads in the front of the helmet. CMOS stereovision heads in the back of the helmet. Hand models In this section, we describe hand shape model, hand dynamical model, hand observation model, and state transition model, which are indispensable to the proposed method. Shape model Hand shape is modeled as a parameterized B-spline curve at time: The shape-space may allow affine deformations of. The constant offset is a hand template curve. The state vector is defined as T q 11 11 Tq 00 10 q x T xy yxyx uu]sin,sin ,1 cos ,1 cos,,[x , 4 where , yxu are a two-dimensional translation vector, is the rotation angle, and , yx are the scaling parameters. Dynamical model In order to simplify tracking, hand dynamics process is defined by , which forms a temporal Markov chain. The new state is conditioned directly only on the immediately preceding state , independent of the earlier history. In the present implementation, hand dynamics is modeled as a 2 1ttp xx tx 1tx nd order Auto-Regressive Processes ARP , conveniently represented in discrete time t as 2nd order linear difference equations: Observation model Figure 4. Observation process The observation process is defined by [8]. In a two-dimensional image, is the set of entire image features visible in the image at time. In order to achieve real-time performance, we detect the edge features in a sparse set of lines normal to the tracked curve. As shown in Figure 4, the black thick line is a hypothesized shape of hand gesture, represented as B-spline curve. The observation density can be computed approximately by M m mtt vp 1 22 2 ,min 2 1 exp xz , 6 where , , 1 tsrtsv mmm z , is the control point of curve , is the closest edge feature to , , tsr m m , tsr , 1 tsmz , tsr m and are the mean and variance of the Gaussian-like density function respectively, and M is the number of curve normals. State transition model In order to put gesture-based interaction into practice, integration of tracking and recognition should be done. In this section, we introduce the state transition model to recognize hand gestures in the tracking loop. This matrix represents the probabilities to switch from a given hand gesture to another one. For example, the transition probability matrix of the four gestures used in this paper is: We extend it to deal with automatic switching between multiple hand gestures. Gesture recognition can be realized via Maximum-A- Posterior MAP estimator based on the sum of the weights of all samples with same discrete variable l at time t: Then the estimation of the gesture parameters is found from the weighted mean of that discrete sample- set: We can simultaneously track hand and recognize gestures with a help of the state transition model. The templates of hand gesture used in our experiments are shown in Figure 5. These gestures represent a limited set of commands that the wearers can give to wearable computers. In our current implementation, four gestures can be recognized, but it is easy to recognize more gestures by establishing more gesture templates. Templates for hand gestures 4. Algorithm We employed the proposed algorithm to perform simultaneously hand tracking and gesture recognition based on the four models described above. In addition, the index fingertip position is also calculated for the purpose of application to hand mouse, image segmentation, handwriting input, etc. In this paper, we only use monocular image sequence to track hand without making use of stereovision information. Computer vision-based hand tracking is extremely difficult in an unconstrained environment. In order to simplify tracking, we make three assumptions as follows: Hand is always upward in the tracking loop. Hand is located in the center of two- dimensional image at the step of initialization. There is only one hand in the field of view FOV of wearable cameras. The iteration process at every time-step is a self-contained factored sampling [11]. Then gesture recognition can be realized via MAP estimator based on the sample-set. The template curve for the hand gestures is drawn by hand, as shown in Figure 5. The hand tracking and gesture recognition algorithm is given in Algorithm 1. Robust hand tracking and gesture recognition 1. Construct the new samples as follows: Measure and weight by means of observed features: Recognize hand gesture at time-step t as Eq 9. Estimate parameters of the tracked gesture at time-step t as Eq If , then calculate index fingertip position See Algorithm 2. Repeat steps until hand is not detected in the image sequence. Fingertip positioning In the gesture temples, Gesture 2 has only one finger, so it is easy to locate the index fingertip of the gesture 2. The furthest point from the centroid of the curve is defined as fingertip approximately. The fingertip positioning algorithm is given in Algorithm 2. Use parameterized B-spline curve to fit Q. Calculate the centroid c of. Find the point cpargpos tsrp , max , pos is the fingertip position. Each group has frames. Hand tracking with single gesture The first two image sequences with single gesture have been captured in the laboratory and the campus respectively. Figure 6 and 7 show the results of hand tracking with single gesture. The mean configuration of hand contour is displayed with the black thick line. Observation parameters were 12 , 4 , and 36M. The algorithm used N samples per time-step to obtain these results. The tracker runs at a frame rate of

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4: Contextual Computing Group: Publications

Ninth IEEE International Symposium on Wearable Computers (ISWC'05) Eighth International Symposium on Wearable Computers Seventh IEEE International Symposium.

Twiddler [32] one-handed data entry module - is this a better one-handed input device than the Kord? Application that monitors device status and send alerts to base station Procedures The database design will extract building floor plans, pictures, owner contact information, and hazardous materials storage for all buildings within one firehouse coverage area from the local government assessment records, local real estate offices, and hazardous materials files. The system will be designed to work with a wearable computer. The wearable components will be modeled after the wearable vest and technology discussed by J. Enhancements to their design will focus on the following areas: This computer interface will be replaced by the WetPC Kord [] or the Twiddler or Twiddler2 [77, 32, 45] data entry components. The WetPC with the Kord data entry tool is a proven technology for deep sea environments and therefore more robust. The Twiddler2 is an enhancement of the original Twiddler data entry keyboard and mouse that can be held in one hand and weighs only 4 ounces. Weight and single handed access are both key factors in wearable computer design. Bluetooth wireless network connectivity will be substituted for some of the wiring in the Personal Area Network, eliminating some of the textile cabling issues discussed in the article. Since the article, several enhancements in the field of battery and power consumption are available, which will be evaluated. Recent articles by Flinn [23, 25], Smailagic [89], Starner [], Martin [50] and Balan [6] speak to the issue of new methods for battery and power usage. The GPS, temperature sensor, accelerator fall monitors and heart rate monitors components remain as used by Rantanen. However, more robust, wireless systems will be evaluated. Add a sonar ultrasonic range sensor for inside the building location sensing [12] that will display location onto a floor plan. Add a visor display of the database information [72, 98] Add a wireless repeater in the fire engine for improved network access. Add a new program to accept input data from the monitoring devices and develop alerts and alarms to be sent via wireless connection to the fire engine base station for the heat, fall and heart rate monitor. Format of Results The results will be a functional prototype of the wearable computer system for fire fighters. A local fire house will be selected for the prototype testing under simulated fire conditions. Feedback will be provided and summarized. Projected Outcome The prototype is expected to function accurately, however, as with any prototype, realistically there may be design and development issues that arise during the design and testing process. The simulated fire fighter testing will take place after the development team testing. The 5 testing fire fighters will provide feedback about the operation and comfort of the computer system. The accuracy of the location detecting equipment will be monitored and recorded. The accuracy of the heart rate and pulse equipment will be tested by comparing to an alternative heart rate and pulse testing method. It is expected that some issues will become evident during the testing that will be used as recommendations for further development and product enhancement. Resource Requirements The ideal process would be to partner with Jaana Rantanen, et. As an independent effort to develop the prototype the resource requirements would be as follows:

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5: CSDL | IEEE Computer Society

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It offers a unified interface to multiple format contents, including interactive 3D, sensors driven QTVRs, and streamed animations. It is based on an IA32 mobile platform with a 3D graphics accelerator. Its operating system is Windows XP Embedded. Introduction One of the goals of a museum is to transfer culture, combining perception and learning into a single action. A wearable device may be the catalyst for such a process: Primary museums organizations [1], including the Smithsonian Institute, are starting to consider this type of pervasive devices called Multi Media Guides MMG , and at the same time Wireless multimedia, Self-awareness of position, Location-based knowledge and Context-sensitive interaction are being considered for broader adoption into the mobile client. This scenario looks like a wide wave of long-term research, to be continued with more capable processors in the future. The museum space is hierarchically organized, and the context is defined as the combination of location, orientation and current hierarchical level. Location and orientation are detected by sensors while steps along the space hierarchy are triggered by keys. Context-changes originate remote queries and support many functionalities, including content access, self-orienting, and synchronization of virtual and physical views. WHYRE look is coherent with its application, and it is different from products like portable PCs, cell phones, or game pads. It is weared with a strap Fig. The graphics and the keys are the result of a unique design process and the interface is the same at all navigation levels, thus the users are continuously reassured about the correctness of their behaviour. The hardware-software platform The hardware originates from the Barracuda and Dolphin concept platforms developed by Intel Labs. The core clock frequencies are and MHz. The sensors provide position, azimuth, as well as roll and pitch information. Wireless comunication occurs thanks to a standard IEEE Location Management relies on both the wireless interface and the sensors. The platform is controlled by an application running on Windows XP Embedded, and consisting of an XML interaction definition file coupled to an execution engine. The XML file specifies the policies while the engine implements the capabilities. Demonstration and evaluation The evaluation was based on two complementary techniques: Age and education level distributions were similar, the majority of the interviewees being graduate people aged between 21 and Main testbed differences were: The responses were quite homogeneus. The proposed approach was perceived as novel, with a significant market potential. Multimedia contents were considered a key feature. As a workaround, the round-neck strap was replaced by a shoulder strap, in order to release the load on the neck. Still, weight reduction requires a challenging and global power- performance optimization process that should start from content production and coding [4]. Eventually the interviewees qualified WHYRE design with the following main adjectives the most frequent first: User testing proved that the approach taken was successful and anticipative. In order to open the way to high-volume applications, weight and power consumption reduction is required. The project was conducted by Ducati Sistemi S. Content providers and hosts for system concept verification are: Whyre is a trademark of Ducati Sistemi S.

6: Wearable Computing at the MIT Media Lab

ISWC , the eighth annual IEEE International Symposium on Wearable Computers, will bring together researchers, product vendors, fashion designers, textile manufacturers, users, and all other interested parties to share information and advances in wearable computing.

Applications of wearable systems in consumer, industrial, medical, educational, and military domains. Use of wearable computers as components of larger systems, such as augmented reality systems, training systems, or systems designed to support collaborative work. Hardware, including wearable system design, input devices, wearable displays, batteries, techniques for power management and heat dissipation, industrial design, and manufacturing issues. Software architectures, including ones that allow wearable computers to exploit surrounding infrastructure. Human interfaces, including hands-free approaches, speech-based interaction, sensory augmentation, human-centered robotics, user modeling, user evaluation, and health issues. Networks, including wireless networks, on-body networks, and support for interaction with other wearables and the Internet. Formal evaluation of wearable computer technologies for example performance of wearable computer technologies or comparisons of existing technologies. Wearable sensors or networks of sensors for context-awareness Operating systems, including such issues as scheduling, security, and power management. Social implications and privacy issues. Wearable computing for people with disabilities. Fashion design, smart clothes, and electronic textiles. Papers Papers may be submitted as short papers up to four pages in length or full papers up to eight pages in length. Accepted short papers and full papers will be included in the printed conference proceedings and presented in the paper sessions. Paper authors are strongly encouraged to upload a supporting video of at most 5 minutes in length along with their paper submission. Papers submitted to ISWC must not be under review by any other conference or publication during the ISWC review cycle, and must not be previously published or accepted for publication elsewhere. Please address any questions about paper submissions to the program committee co-chairs, Bruce Thomas bruce. Posters Posters are submitted in the form of a summary of up to two pages in length. Accepted poster summaries will be published in the conference proceedings and the poster will be presented at the conference poster and demonstration session. Please address any questions about poster submissions to the program committee co-chairs, Bruce Thomas bruce. Demonstrations Demonstrations provide an opportunity to show research prototypes and works in progress to colleagues for comment in a relaxed atmosphere. Paper and poster presenters are also highly encouraged to demonstrate their work. Accommodations power, space, etc. To apply to perform an informal demonstration, please prepare a one-page summary that describes what you plan to demonstrate. Include pictures and diagrams, so that your proposed demonstration can be clearly understood, and provide a clear description of the power and space requirements. Accepted demonstrations will be presented at the conference poster and demonstration session; however, they will not be published in the conference proceedings. Please address any questions about demonstration submissions to the Demonstrations Chair, Cliff Randell cliff [at] compsci. Tutorials We invite you to share your wearable-related knowledge with other conference attendees in a tutorial format. A tutorial is an intensive couse on a special topic. Half-day tutorials and advanced tutorials will be held on Sunday, October Tutorials are intended to enhance the skills and broaden the perspective of their attendees. They should be designed to introduce a rigorous framework for learning a new area or to provide advanced technical training in an area. A two-page tutorial proposal should include a clear description of the topic area, objectives, and the intended audience experience level and prerequisites. Tutorial proposals should also include a word abstract, a topical outline of the content, and a summary of the qualifications of the instructor s. Be sure to include the contact name, affiliation, address, telephone number, electronic mail address, and associated URL for each instructor or organizer. Please address any questions about tutorial submissions to the Tutorials Chair, Francine Gemperle fg24 [at] andrew. Exhibits We invite you to exhibit your products, designs, services, or research projects during the conference. Exhibits will be available continuously in a venue near the meeting room. Exhibitors will show their products and distribute promotional literature to interested conference attendees. The number of exhibitors that are accepted for the conference will be limited by available space. To apply to be an exhibitor, write a summary of the product, service, or research project that you hope to exhibit, describing why it will interest the conference attendees. The summary should not exceed words one page in length. Be sure to include in the summary the exhibitor names, affiliations, addresses, telephone numbers, electronic mail addresses, and URL. Also, identify the contact person for the exhibition. Applications to exhibit at ISWC , and any questions should exhibiting, should be submitted by email directly to Tom Martin tlmartin [at] vt. Come to the conference with your best toys for an informal show-and-tell.

7: International Symposium on Wearable Computers - Wikipedia

8th International Symposium on Wearable Computers (ISWC), 31 October - 3 November , Arlington, VA, USA. IEEE Computer Society , ISBN X.

8: Methods for interrupting a wearable computer user

Ninth IEEE International Symposium on Wearable Computers (ISWC'05) Eighth International Symposium on Wearable Computers Seventh IEEE International Symposium on Wearable Computers,

9: Wearable computer - Wikipedia

Eighth IEEE International Symposium on Wearable Computers (ISWC) Student colloquium, Arlington VA November A Shiver Motion and Core Body Temperature Classification for Wearable Soldier Health Monitoring Systems (PDF).

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Favorite Bible Women Mary, Ruth, Sarah, Martha Confederate military manuscripts A list of newspapers in the university libraries of the prairie universities of Canada IRA in historical perspective Immediate aftermath Manual de la siget el salvador Plymouth county marriages, 1692-1746 German-American names Teens and drunk driving Father Babad to Cecilia 83 CSET Social Science 7-12 Maintaining your motivation. My Book of Mean People Journal Beyond the Fairy Tale (Simply Put) Face to face with Fidel Castro Christmas Trunk: page 131 My big book of everything Talk Now! Burmese Combatting old and new social risks Evelyn Huber and John D. Stephens Srpsko ruski recnik Maya angelou poems book Acupuncture soap notes cpt example Lurias legacy in the 21st century Vegetables in patches and pots The beginnings of OPA. Jesus-The Life Changer Design a label seal orange create labels Tennessee soldiers in the Revolution Conventional angiography in the noninvasive era The Gift of the Magi (Pixie) Soldiers and settlers Social life in the Bahamas, 1880s-1920s Psychotherapy of antisocial behavior and depression in adolescense Program integration management Latchstring to Maine woods and waters Carlingford Lough The Cocktail Bible Thoroughbred handicapping as an investment History of erp systems Ten Anglo-Welsh poets