

Towards New Interaction Spaces Accessible For All

UTC – COSTECH – CRED

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PCRD7 - Journée d'information "TIC et santé" - 10/09/12

CRED – Cognitive Research and Enaction Design

- Interdisciplinary research team
 - Fundamental research: technology, cognition
 - Applied research: product and software design
- (A curved arrow on the left indicates a cycle between the two research types.)
- Research themes



A word cloud of research themes. The words are arranged in a roughly rectangular shape. The most prominent words are 'perception' (top, orange), 'technology' (right, black), 'communication' (center, yellow), and 'perceptual supplementation' (bottom, yellow). Other words include 'perceptual crossing interaction', 'user experience', 'impairment', and 'appropriation'.

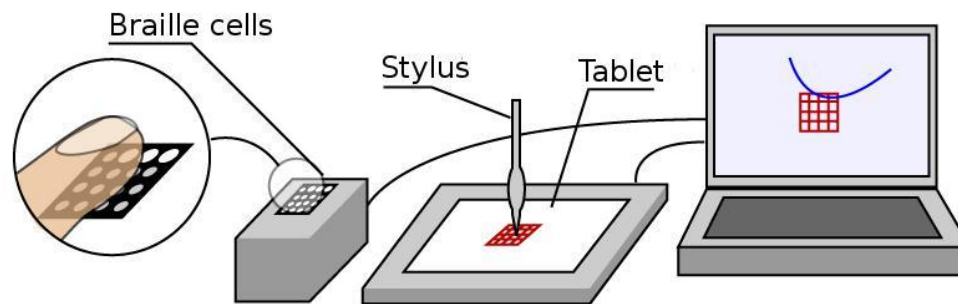
Technology: Tactos / Intertact

- Tactos

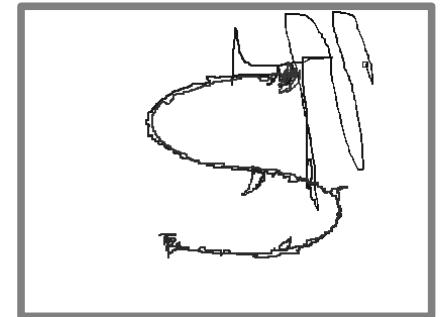
- Perceptual supplementation system for spatial interaction
- Accessible for the visually impaired persons and for all



a) Tactile device



b) Interaction system



c) A user interaction record

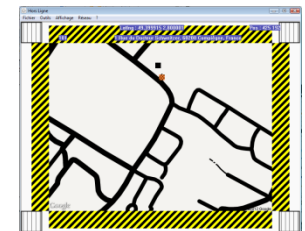
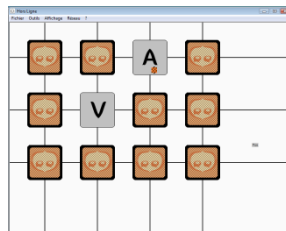
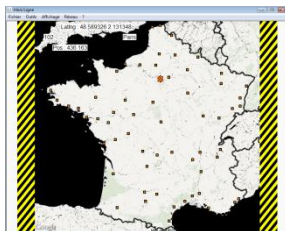
Shapes recognition, spatial navigation...

➔ Research on the basics of human perception

Technology: Tactos / Intertact

- Intertact

- Multimodal online space: tactile, audio, visual
- Multiusers applications → Perceptual crossing



Development of the use and mobility of Tactos
→ Gathering a users' community

Historical perspective

- Achievements
 - 8 Phd thesis (3 ongoing)
 - 2 patents
 - Institut Normandie Lorraine
 - ➔ School dedicated to the young visually impaired
 - PORTINTERTACT (Regional project)
 - ➔ Tactile Internet portal
 - ITOIP (Regional project)
 - ➔ Tactile Interaction for Orientation, Information and Presence
 - ➔ Participatory design approach with VIP

Perspectives

- Projects opportunities on:
 - Use in mobile context
 - Smartphones accessibility
 - Accessible workstations
 - Entertainment and accessible gaming
 - Special needs education
 - Low vision - Age-related macular degeneration (AMD)
 - Multimodal interfaces

Thanks for your attention

- **Contacts**

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Reference

Lenay, Charles, et John Stewart. « A Minimalist Approach to Perceptual Interactions ». *Front. Hum. Neurosci.* (2012).

Froese, Tom, et Charles Lenay. « Imitation by social interaction? Analysis of a minimal agent-based model of the correspondence problem ». *Frontiers in Human Neuroscience* 6 (2012): 202.

Deschamps L., Le Bihan G., Lenay C., Rovira K., Stewart J. et Aubert D. « Interpersonal Recognition Through Mediated Tactile Interaction ». In *Proceedings of IEEE Haptics Symposium 2012, March 4-7*, 239-245. Vancouver, Canada, 2012.

Lenay, C., Gapenne, O., Hanneton, S., Marque, C., and Genouëlle, C. Sensory substitution: Limits and perspectives. In *Touching for knowing*. 2003, 275–292.

Vers de nouveaux espaces d'interactions numériques accessibles pour tous

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CRED – Cognitive Research and Enaction Design

- Équipe de recherche interdisciplinaire
- Recherche fondamentale : technique, cognition
- Recherche appliquée : design, informatique

- Thèmes

perception handicap
suppléance perceptive
technologie
croisement perceptif communication
appropriation expérience utilisateur
interaction

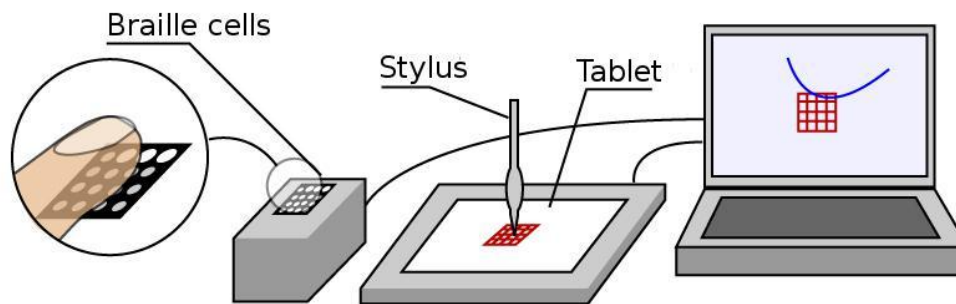
Acquis technologiques : Tactos / Intertact

- Tactos

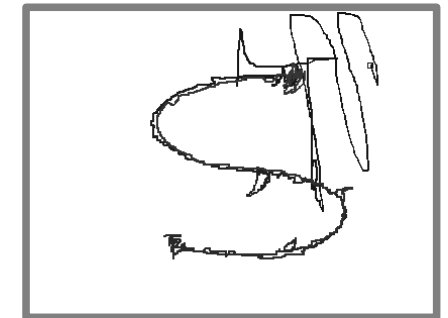
- Interface innovante pour les espaces numériques
- Accessible pour les personnes aveugles et pour tous



a) Module d'Interactions Tactiles



b) Fonctionnement



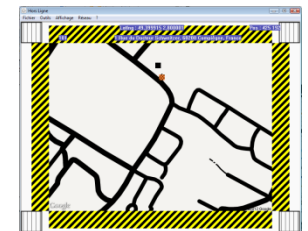
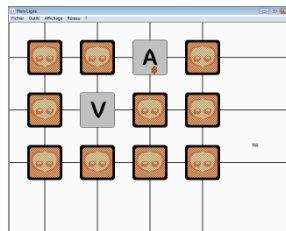
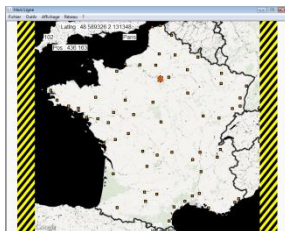
c) Trace d'utilisation

Reconnaissance de formes, orientation spatiale ...
➔ recherche sur les fondements de la perception

Acquis technologiques : Tactos / Intertact

- Intertact

- Espace en ligne multi-modal : tactile, audio, visuelle
- Salles interactives et multi-utilisateurs



Développer les utilisations et la portabilité de Tactos
→ initier une communauté d'utilisateurs

Historique

- Réalisations
 - 8 thèses (3 en cours)
 - 2 brevets
 - Institut Normandie Lorraine
 - Déploiement dans le contexte de l'enseignement adapté
 - Portintertact (projet régional)
 - Portail internet tactile
 - ITOIP (projet régional)
 - Interactions Tactiles pour l'Orientatation, l'Information et la Présence
 - Démarche de conception participative

Perspectives

- Opportunités
 - Usages en mobilité
 - Accessibilité des smartphones
 - Équipement de postes de travail
 - Loisirs numériques et interactifs
 - Enseignement adapté
 - Basse vision - DMLA
 - Interfaces multimodales

Merci de votre attention

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