CPSC 448

PROJECT PROPOSAL

by

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Supervisors: Dr. Karon MacLean, Assistant Professor,
Department of Computer Science

Dr. Alejandro Lleras, Postdoctoral Fellow,
Department of Psychology

I. Background

The work associated with this project will focus on one specific aspect of the broad research area of Haptic and Physical Interfaces, and it addresses the need to extend into an alternate sensory area the present utilization of computers as information-providers [1]. Namely, it will expand on the Haptic Icons (thereby refer to as Hapticons) concept presented by Mario Enriquez in his Masters Thesis Proposal [2]. In particular, Mr. Enriquez developed a method for identifying a set of Hapticons maximally spaced perceptually, given a specific set of design parameters – e.g. force feedback, signal frequency, amplitude, and waveform.

II. Goals and Anticipated Contribution

In my Directed Studies work, under the direct supervision of Dr. Karon MacLean and Dr. Alejandro Lleras, I shall focus on exploring an alternate approach to constructing Hapticons, approach thereby refer to as the "Phoneme Model." Id est, the core of the project shall focus on developing a viable process that will allow the construction of a potentially unlimited set of Haptic "Words", each individual Haptic Word being based on a subset of distinct primitives, or Haptic "Phonemes". The project's specific goal is to identify a set of (approximately 5 to 6) suitable primitives (Haptic Phonemes), which will satisfy the combined requirement of sequential and layered construction – without perceptual distortion. This process will entail an iterative Hapticon-design/User-testing cycle, to be conducted in the Imager Computer Graphics Laboratory (at the Department of Computer Science of the University of British Columbia), using available Haptic hardware.

III. Milestones

1. Preliminary environment-set-up work.....(estimated) by January 24, 2003
2. Resources search.....(estimated) by January 29, 2003
3. New concepts (i.e. Psychology field-related) learning.....(estimated) by February 07, 2003
4. Identify a first subset of Haptic Phonemes.....(estimated) by February 21, 2003
5. User Tests for this subset.....(estimated) by February 26, 203
6. Iterate steps 4 and 5.....throughout February, March 2003
7. Report generation, revision, final version completed.....(estimated) by April 09, 2003

IV. Deliverable

Final Report outlining the steps undertaken in the Haptic Phonemes model building-process, Haptic Phonemes identifying-process, User Testing procedures and results, significant changes resulting from the Hapticon-design/User-testing iteration process, and conclusions inferred from the project's results.

V. Proposed Work Period

Following the approval of this proposal, I will drop CPSC 430 and CPSC 415 – courses in which I am currently registered (see attached Timetable), and dedicate the hours currently allocated for the mentioned courses to work pertaining to this project.

VI. References

[1] MacLean, K. E., Enriquez, M., DiLollo, V. (2002). "Perceptual Design of Haptic Icons: Towards an Expressive Haptic Language"

http://www.cs.ubc.ca/~enriquez/hapticIcons-submitted.pdf

[2] Enriquez, M. (2002). "A Study of Haptic Icons"

http://www.cs.ubc.ca/~enriquez/Enriquez%20Thesis%20Final.pdf