NavBelt and the GuideCane

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1. What is the main difficulty with the NavBelt system? How does the GuideCane solve the problem?

2. The authors mention some other existing approaches that assist visually impaired people – what is the main difference between the GuideCane and these other methods? What benefits have GuideCane over these other methods?

3. The NavBelt can be used in three different modes, i.e. guidance, directional-guidance and image mode. From the system (the NavBelt system) and the user's point of view, what exactly differ between the three modes of the obstacle avoidance system? Which do you think is the hardest to implement?

4. What obstacles are detected by the sonar sensors (in the NavBelt and the GuideCane systems)? It would of course be desirable to detect obstacles as far away from the sensor as possible – what happened when they tried to increase the detection range of the sonar sensors. What causes the problems? The authors use a method, referred to as EER UF, to be able to fire the sensors faster – what does this method do?

5. Sonar sensors have a lot of problems, e.g. cross-talk and interference with other sonar sensor on other vehicles working in the same environment – why not use a 'better' sensor such as e.g. a laser sensor?

6. Where would you use the GuideCane system? Would you use it anywhere - why?

7. How does the GuideCane system interact with the user? How is staircases (upwards and downwards) detected?

8. One major advantage of the GuideCane system is that it can lead the user around an obstacle and then return to the original path (direction) – why is this possible?

9. The new technique of force feedback is used in the GuideCane system – how?

10. The GuideCane system gives the user a good local navigation aid but not a global one – why?