

Implementation of the SLA on the Perspeckz Testbed

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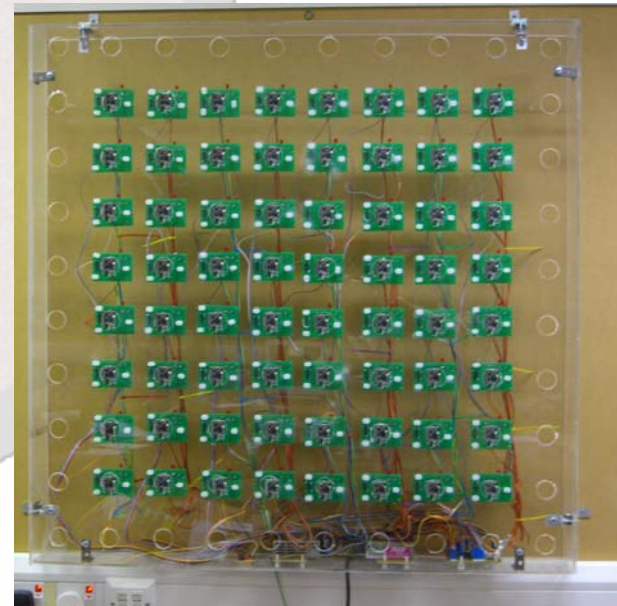
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Perspeckz

- Perspeckz 64 is a test bed for Specknet prototypes.
- 64 Prospeckz II's can be mounted in an 8x8 grid for wireless programming and user control of power supply.

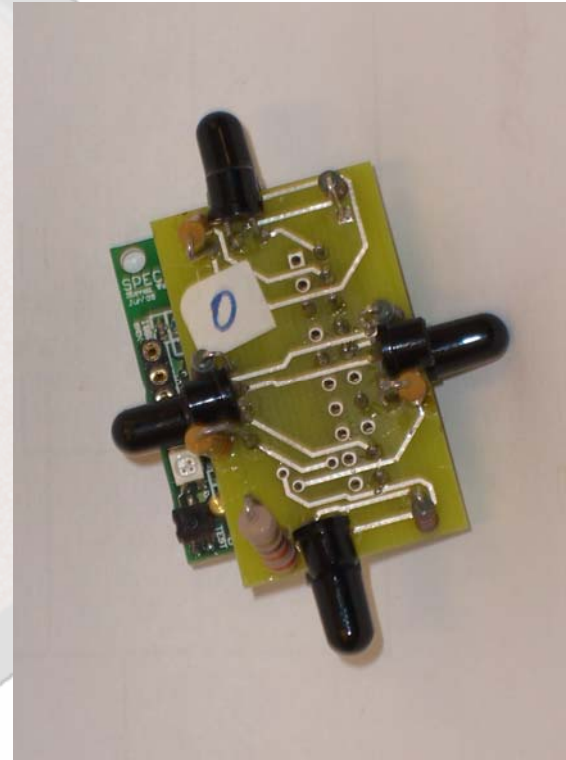
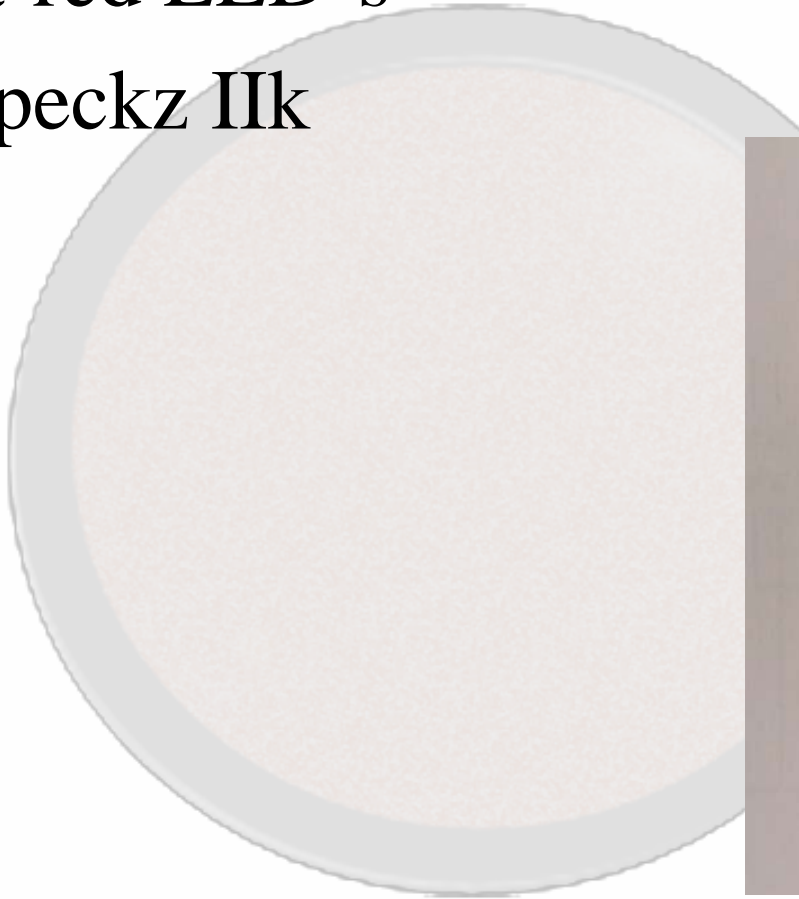


Sectoring

- Ideally needs full receiver coverage around the device.
 - Lots of narrow transmitters
 - Few diverse transmitters
- VCSELs not viable for first developments
 - Not enough of them manufactured
 - Too narrow transmission and reception angles
- Solution.....

Sectoring

- Infra-red LED's
- Prospeckz IIk



Sectoring

- 4 IR Transmitters
 - Multiplexed, so only transmit on one at a time.
- 4 IR Receivers
 - Multiplexed, so only listen on one at a time.
- Software tracking is used to track and lock the signal.

Sectoring

- 16 bit fixed point implementation
- Lookup tables for Trig
- No inverse tangent, so angle estimation isn't perfect
 - Gets worse with more neighbours

Sectoring

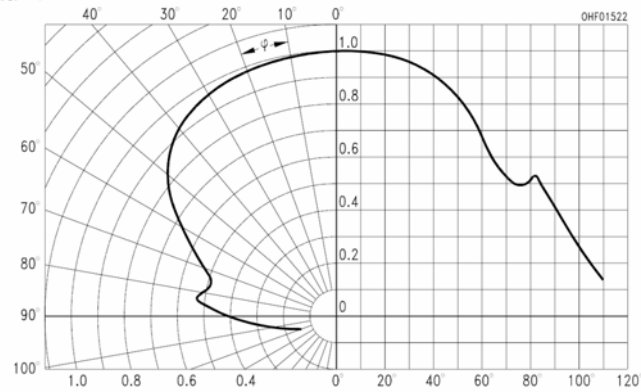
- Each device periodically listens on each IR receiver.
- Transmissions are made periodically through each IR transmitter.
- Position estimation is updated when new data is received.
- Sends updated position to base station using radio.
- Base station forwards it onto the PC Visualiser.

Issues

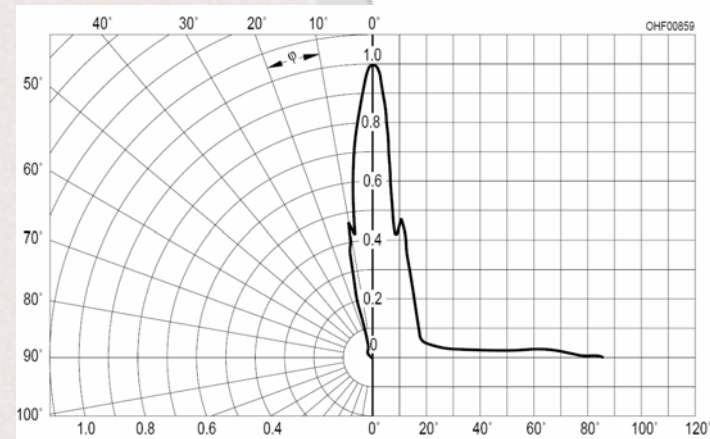
- Sectoring algorithm assumes simple transmission cone.
- Not that simple in practise!

Directional Characteristics

$$S_{\text{rel}} = f(\varphi)$$



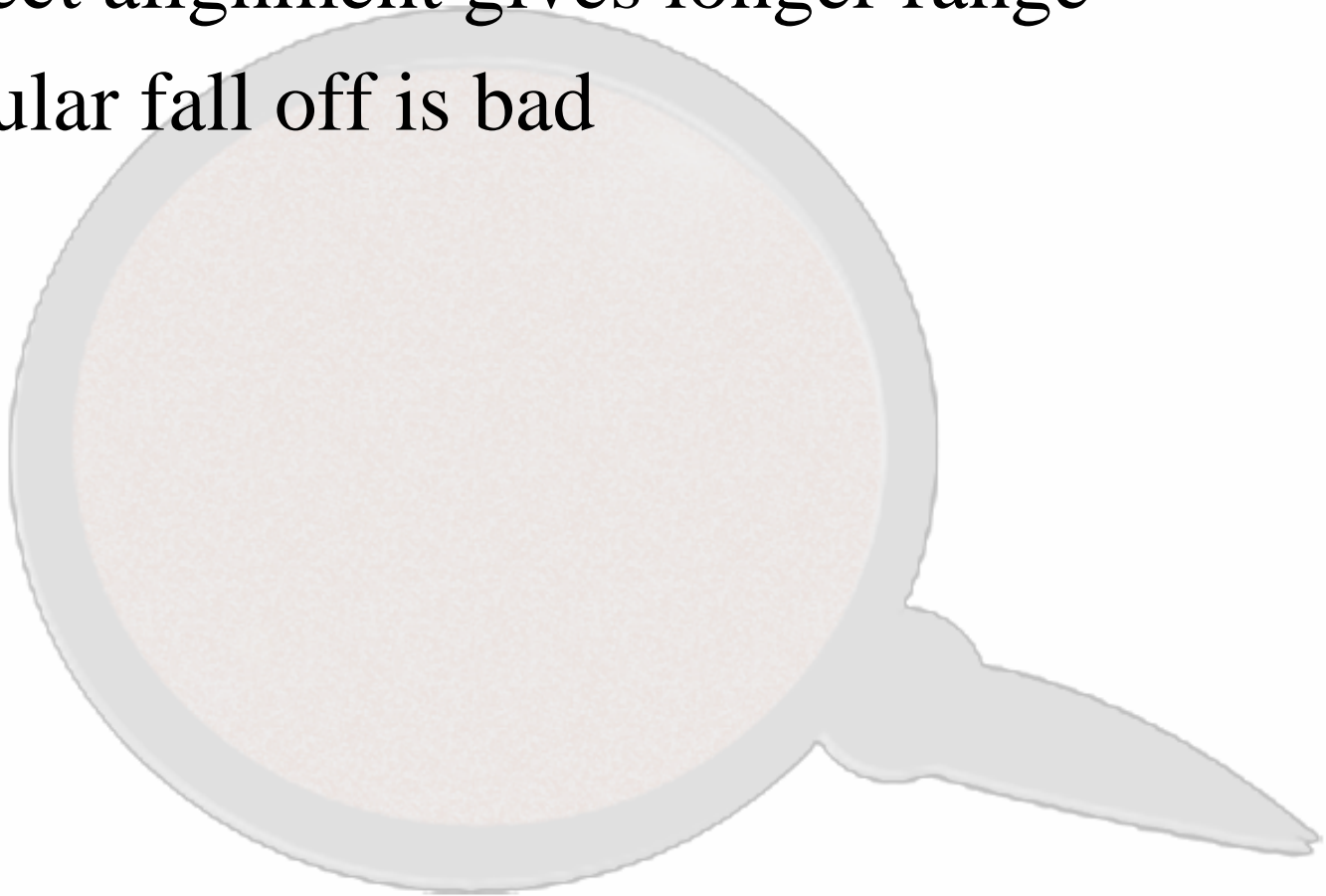
Receiver



Transmitter

Issues

- Perfect alignment gives longer range
- Angular fall off is bad



Issues

- Perspeckz only allows Grid like arrangements, not all cases covered
- Devices fail to communicate sometimes.

