Nighttime Vehicle Detection on Smartphones

Designed for the Windows Phone

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Night Time Detection

- Based on Taillight detection
- Position of taillight on image important
  - Ignore noise above horizon
  - Ignore noise near headlight
- Embedded algorithm has to be simple
- Algorithm broken down to simple conditions to detect

Windows Phone

- Windows Phone 7.5 (Mango) added support for live camera stream editing
- Create app with ‘saveable’ previews
- Process image in under reaction time
  - Can still be optimized
- Managed code – C#
Results

A: Original Image
B: Otsu’s Binarization of ROI
C: Morphological Open
D: Detect Taillights
Conclusion

• First level simple app to track vehicles at nighttime using taillight color
  • Easy to achieve due to limited spectrum of taillight
• Detects position to good accuracy in sub-urban environments
• More improvements can be made in performance
• More features can be added in the future