
An Embedded Platform Based Public Safety Cognitive Radio

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Outline

- Introduction
- Original PSCR
- Embedded PSCR
- Future Work
- Questions

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Introduction

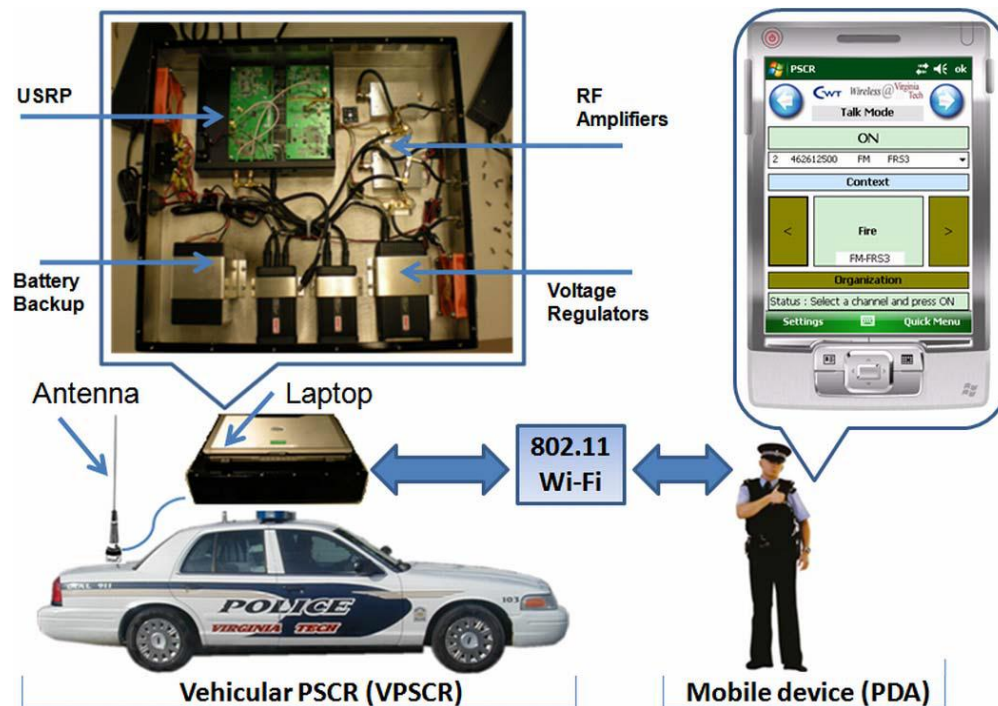
- Public safety radio incompatibility
 - Legacy FM
 - P25 (Phase I and Phase II)
- Thales Liberty
 - Legacy FM & P25 (conventional & trunked)
 - 136-174MHz, 380-520MHz, 700MHz & 800 MHz
- Harris RF-1033M
 - 30-50MHz, 136-174MHz, 380-512MHz
 - FM/AM & P25 Conventional
- Harris Unity XG-100
 - Extends RF-1033M to 700 & 800MHz
 - Full P25 compliance

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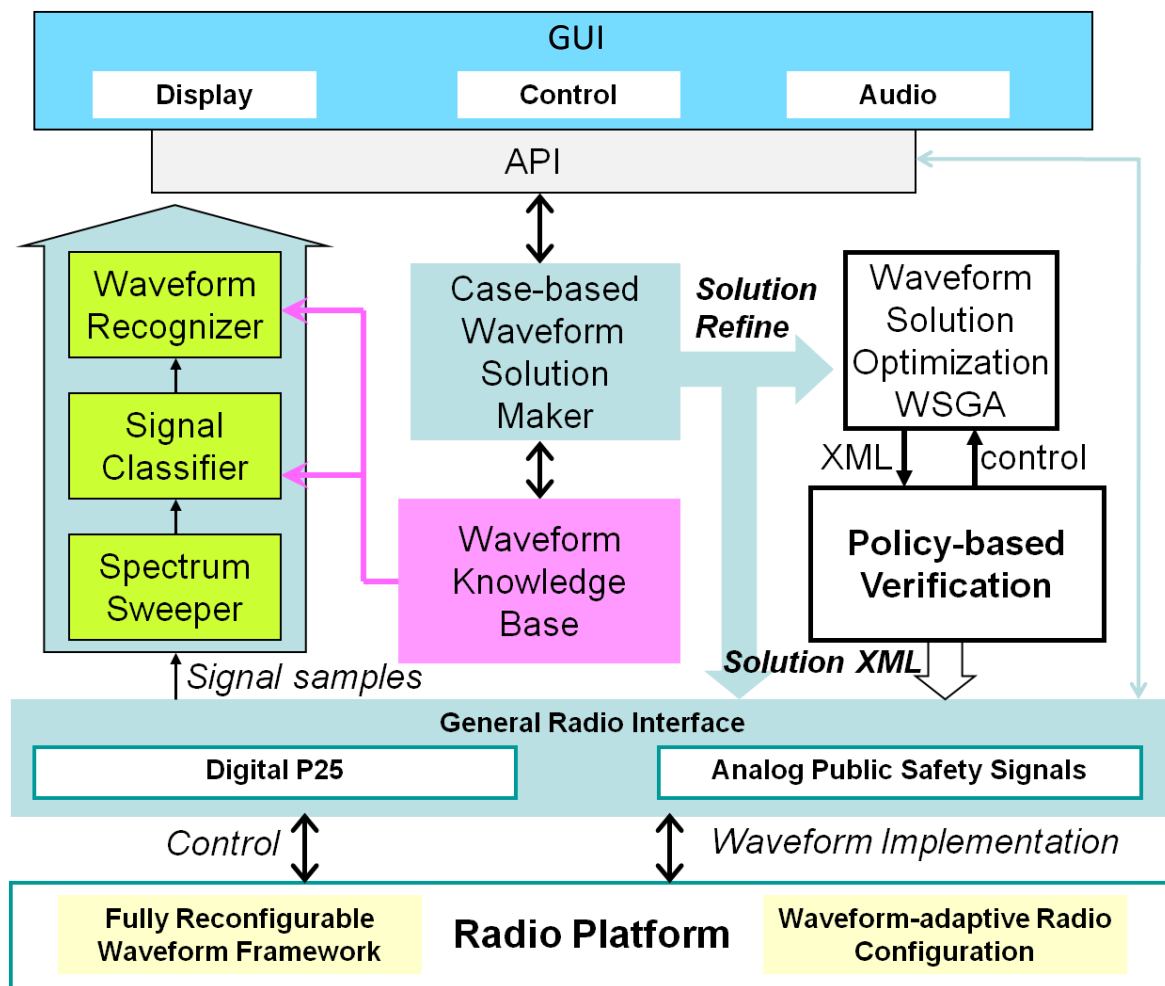
Original PSCR

- Main Functions:
 - Sense
 - Push-to-talk
 - Gateway
- Hardware



Original PSCR

- Software Architecture



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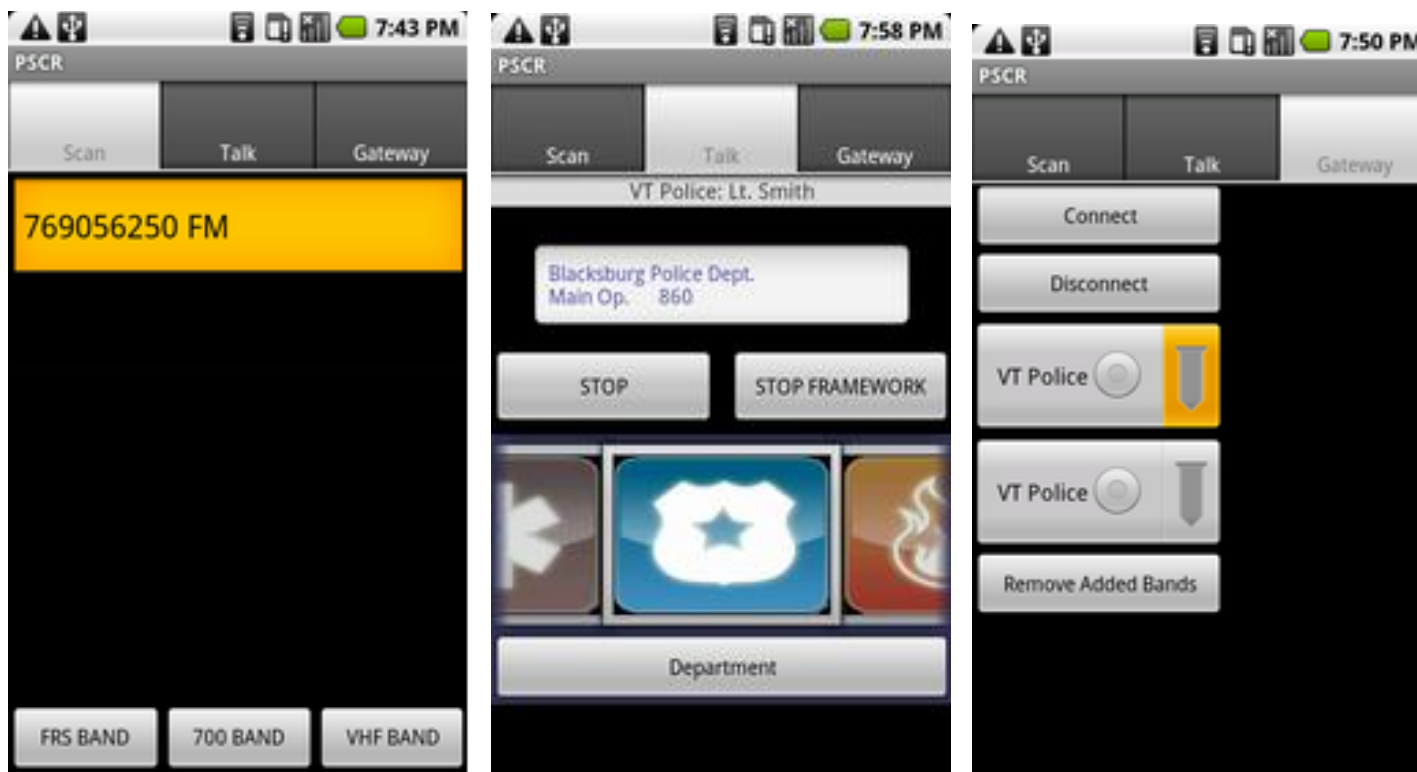
Embedded PSCR

- Hardware
 - USRP E100
 - TI OMAP3530
 - Google Nexus Phone
 - WBX Daughterboard
 - 50-2200MHz



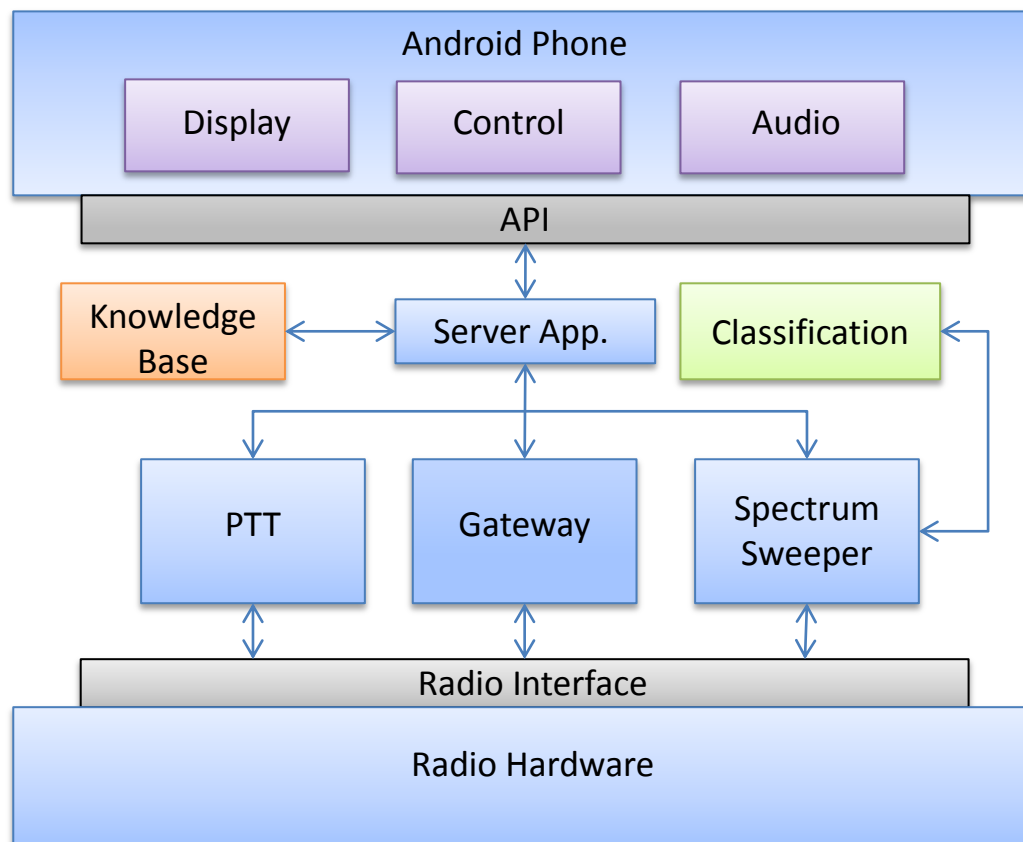
Embedded PSCR

- User Interface



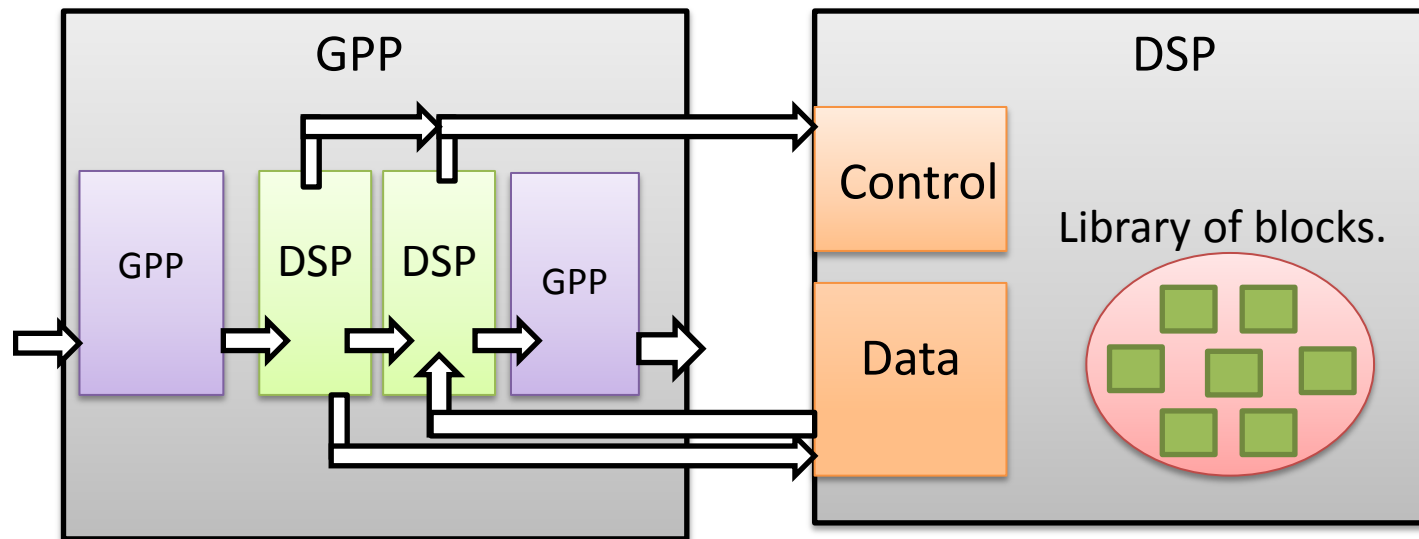
Embedded PSCR

- Software Architecture
 - GNU Radio



Embedded PSCR

- Platform Support
 - TI OMAP3530
 - ARM Cortex A8
 - TI C64x+ DSP
 - GNU Radio + Custom Blocks on DSP



Embedded PSCR

- Radio Flowgraphs
 - Push-to-Talk
 - FM
 - P25 – Vocoder issue
 - IMBE - Improved Multi-Band Excitation.
 - Gateway
 - Frequency translation
 - Can perform full mod/demod to support other modulations

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Future Work

- P25 support
- GPS Location
- Digital radio

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Questions

- Thanks for listening ... Questions ???

Acknowledgements



National Institute of Justice

The Research, Development, and Evaluation Agency of the U.S. Department of Justice

–This project is support by Awards 2005-IJ-CX-K017 and 2009-SQ-B9-K011 awarded by the National Institute of Justice, Office of Justice Programs, US Department of Justice. The opinions, findings, and conclusions or recommendations expressed are those of the author and do not necessarily reflect the views of the Department of Justice.



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WHERE DISCOVERIES BEGIN

–This material is based upon work supported by the National Science Foundation under Grant No. CNS-0519959. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation (NSF).