Spectrum Sensing Communication

UNIVERSITY OF NOTRE DAME

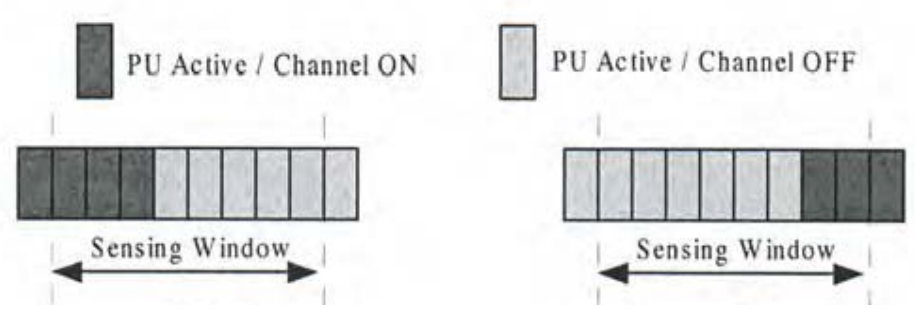
Office of Technology Transfer

Sequence Detection in Dynamic Spectrum Access Networks

Pat. Pending #13/080,607

Background

Secondary users of a licensed radio band need a reliable means of detecting the primary users presence. Optimally sharing a communication channel requires accurately finding holes in the PU's transmission. Knowing both when a SU can and cannot transmit allows both users to maximized data transmitted.



Technology

The PU access pattern is exploited in order to benefit channel access by the SU. Errors involved in sensing PU access involve both missed detections, causing interference, and missed openings, unnecessarily limiting the SU. Both errors can be weighted to account for the different cost factors experienced by a SU on a PU's channel.

Decision making by the SU is improved over time as the PU access pattern is developed. A forward-algorithm is used to calculate an on/off estimate for the PU and can be combined with a backward algorithm to increase predictive accuracy.

PU sensing is conducted in order update the predicted state of the PU and improve system performance.

Advantages

- Avoids the shortcoming of energy detection which can be ineffective in high noise, low SNR environments
- Weight factors can be modified to account for systems costs, constraints, and specific channel regulations.
- PU state change in the middle of a sensing window can be modeled for further exploitation by the system

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10-013, Sequence Detection

this technologies made possible by the efforts of students, researchers and faculty at . . .

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Tech ID	Technology Title	Status
10-013	Sequence Detection in Dynamic Spectrum Access Networks	Received

Patent Title	Type	Ctry	Status	Serial No.	File Date
Sequence Detection Methods, Devices, and System for Spectrum Sensing in Dynamic Spectrum Access Networks	Utility	US	Filed	13/080,607	4/5/2011
Inventor(s): PI - Laneman, J. Nicholas / Sun, Zhanwei					
Sequence Detection Methods, Devices, and Systems for Spectrum Sensing in Dynamic Spectrum Access Networks	PCT	WO	Filed	PCT/US11/31296	4/5/2011
Inventor(s): PI - Laneman, J. Nicholas / Bradford, Glenn / Sun, Zhanwei					

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