Real-time Classification via Sparse Representation in Acoustic Sensor Networks

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Outline

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• Acoustic Sensor Networks
• Animal Sound Database
Introduction

• **Acoustic Sensor Networks (ASNs)** have a wide range of applications in natural and urban environment monitoring, as well as indoor activity monitoring.

• In-network classification is critically important in ASNs because wireless transmission costs several orders of magnitude more energy than computation.
Introduction

• Given \( m \) classes of signals for training, test data may belong to \( i \)-th class or unknown class.
Real-time Classification via Sparse Representation in Acoustic Sensor Networks, SenSys 2013

- Aim: automatic vocalization recognition, e.g., cockatoos and rainbow lorikeets
- Each ASN node **complete the real-time classification** on its own. Then, each node sends its **classification results** to a server.
Real-time Classification via Sparse Representation in Acoustic Sensor Networks, SenSys 2013
Real-time Classification via Sparse Representation in Acoustic Sensor Networks, SenSys 2013

- System of chart

Animal Sound Database

- Frog
  - 3 species of frogs for training and 7 species for testing
Animal Sound Database

• Cricket
  – contains consists of 20 species of insects, 8 of which are Gryllidae (crickets, 蟋蟀) and twelve of which are Tettigoniidae (katydids, 螽斯)
  – we can treat the problem as either a 20-class species level problem, or 2-class genus level problem.
Reference


