**Motivation**

- Radio signal reception close to the noise floor results in **corrupted** packets.
- Many of such packets have only a **few** bits corrupted.

![Error frequencies in data are taken from a real WSN node outdoor deployment](image)

**Packet corruption causes**

**Cause A:** external interference
- **Pattern:** bursty errors
- **Effect** from applying Hamming code: small or negative

**Cause B:** weak links
- **Pattern:** independently distributed symbol errors
- **Effect** from applying Hamming code: great!

**Implementation**

- On top of Contiki WSN OS
- Modify ContikiMAC layer to include classifier value collection and FEC encoding & decoding
- Modify radio driver to accept packets with invalid CRC
- Modify Cooja simulator to include our bit error model

- We are IEEE 802.15.4 MAC (almost) compatible:
  - MAC frame header always sent in plaintext
  - ACK sent iff the packet can be decoded successfully

**Evaluation**

- Preliminary work with a simulator (Cooja)
- Evaluate in multihop networks
- What's the impact on:
  - Hop-by-hop PDR?
  - End-to-end performance?
  - Energy efficiency?

**Conclusions:**

- Adaptations can lead to and are required for reasonable performance
- Further improvements possible (in decisions, FEC)

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