Smart Integrated Farm Network for Rural Agricultural Communities (SIRAC)

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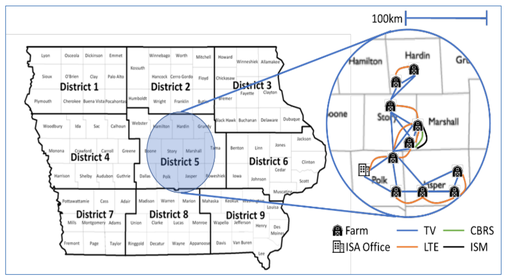
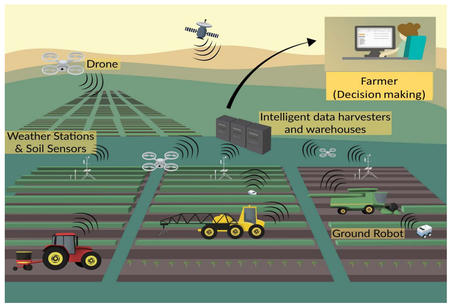
Award Type (IRG), Solicitation Year (IRG-2, FY2020)

The novelty of SIRAC project is to advance rural connectivity and community decision-making, with social translational research to address adoptability, trust, risk preferences, and economic benefits for farmers. Mobile crowd sensing and ML based privacy preservation will improve trustworthiness and decision accuracy of information spread.

With a goal to form a community of Smart and Connected Farms (SCFs), we create a Smart Integrated Farm Network for Rural Agricultural Communities (SIRAC).



Intellectual Merit: Develop smart sensing and IoT based flexible, scalable and efficient communication infrastructure for SCFs; Exploit mobile crowdsensing and multiband dynamic spectrum access technology for rural connectivity; Privacy-preserving data analytics for community-level decision-making across farms and monitoring real-time threats; and Translational research model with behavioral experiments will identify social and economic incentives for farmers/stakeholders.



- SIRAC was formed with active involvement of Iowa Soybean Association, an organization with 10,000 farmer members, to tackle their need for farm connectivity. This project was initiated in October, 2020.
- Agreements with eight farmers signed.
- Protocols developed for feedback process researchers, farmers, community of practice (CoP).
- SIRAC involves eight Iowa farmers in core group where research will be done; but the CoP involves >200 farmers. Knowledge dissemination to ~10,000 IA farmers.

Broader impact (immediate)

Farmers in the mid-western states will have timely data sharing and knowledge exchange for coordinated responses to crop production threats, ensuring profitability. Positive impacts on farmers, farm workers, their families, ag industry

Broader impacts (sustainability)

Flexible, scalable, efficient communication infrastructure for SCFs; provide privacy-preserving data analytics for community-level decision-making; learning and feedback among CoP, trusted data and technology acceptance, and economic benefit to SCFs.

Planned Activities and Expected Outcomes

- Data collection on farmer field.
- Prototype of technology/tool for connectivity on farms.
- Workshops with farmers in the network and community of practice; a feedback loop translational process for SCFs.

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