

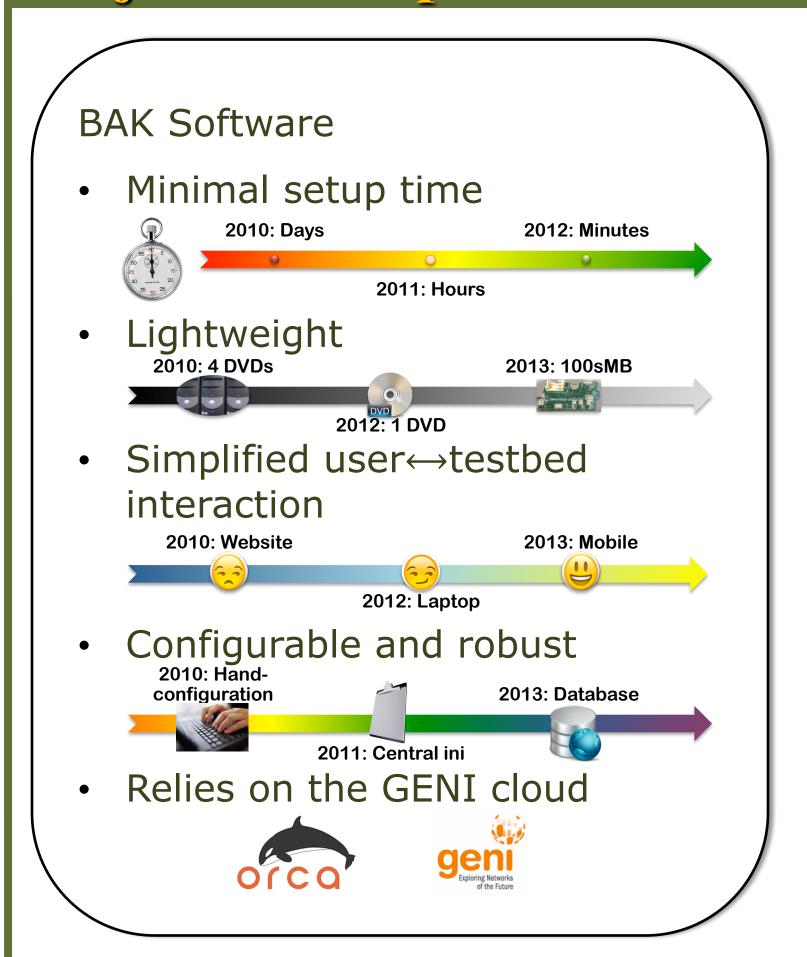
Benchtop miniArray Kits

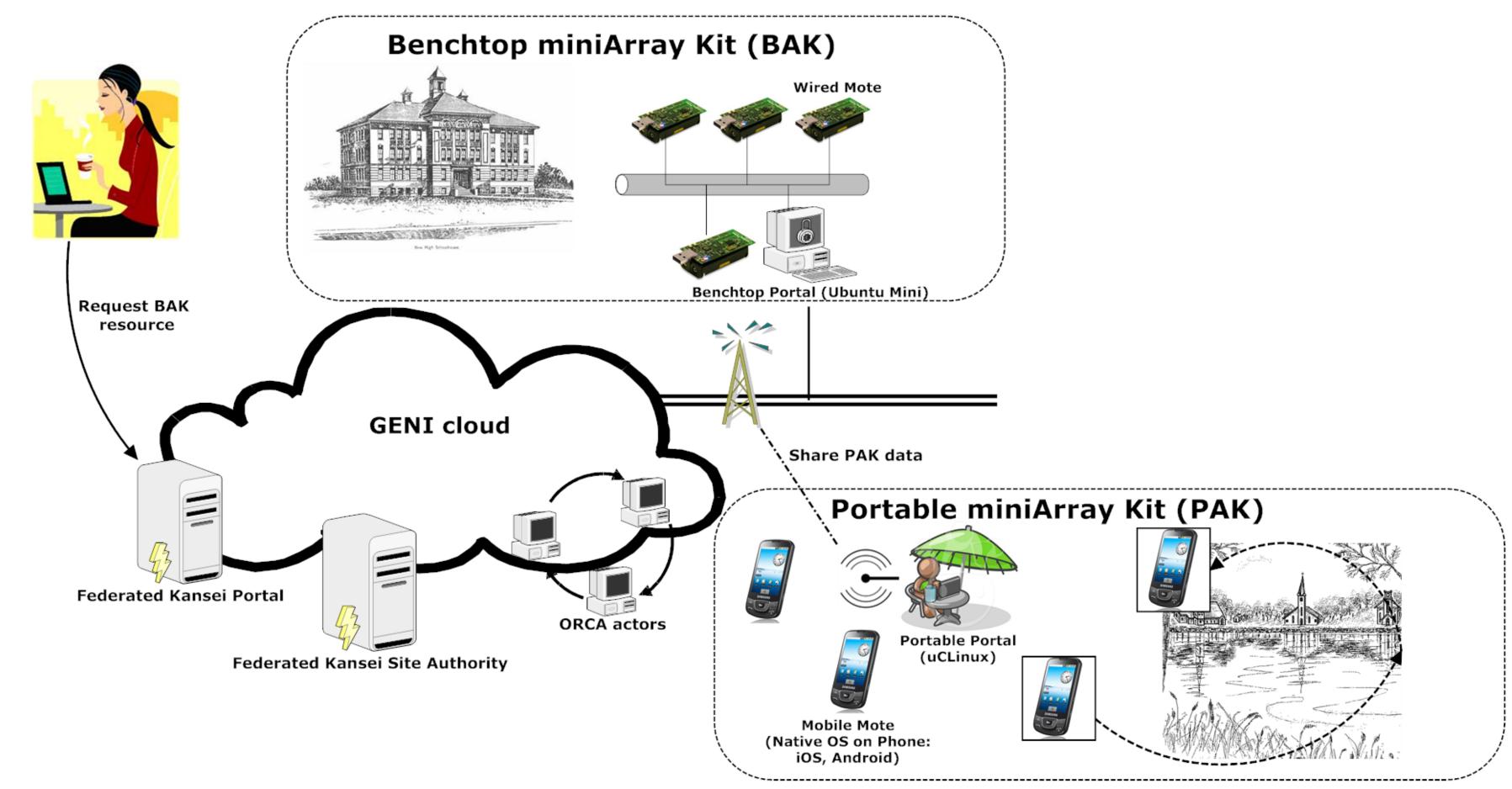
GENI Educational Kits using Wireless Sensor Networks



http://kansei.cse.ohio-state.edu/bakpak

Project Accomplishment: Benchtop miniArray Kit





STEM Concept and Curriculum Development

Science Experiments for STEM Student Users

- Low cost sensor kits
- Multi-purpose compared to specialized science education equipment
- Hands-on learning via experiment activities
- Build intuition with real empirical data
- Lesson plans and experiment software, some bundled with kits and others downloadable from cloud

Experiment Steps

- 1. Point-Click-Deploy experiment with BAK kit
- 2. Run experiment to sense sound, movement, temp...
- 3. Collect and visualize data at local portal
- 4. Push data into cloud

Outreach

- Engaged undergraduate students to prototype PAK Android application
- Working with STEM educators to develop curriculum corresponding to national standards
- Initial training sessions and demos in India and America
- Teachers provide positive feedback for using WSN experiments to teach abstract concepts, critical thinking

Sample Lessons

- "Speed of sound"
- "Pendulum properties"
- "Light at the end of a tunnel"
- "Temperature maps"

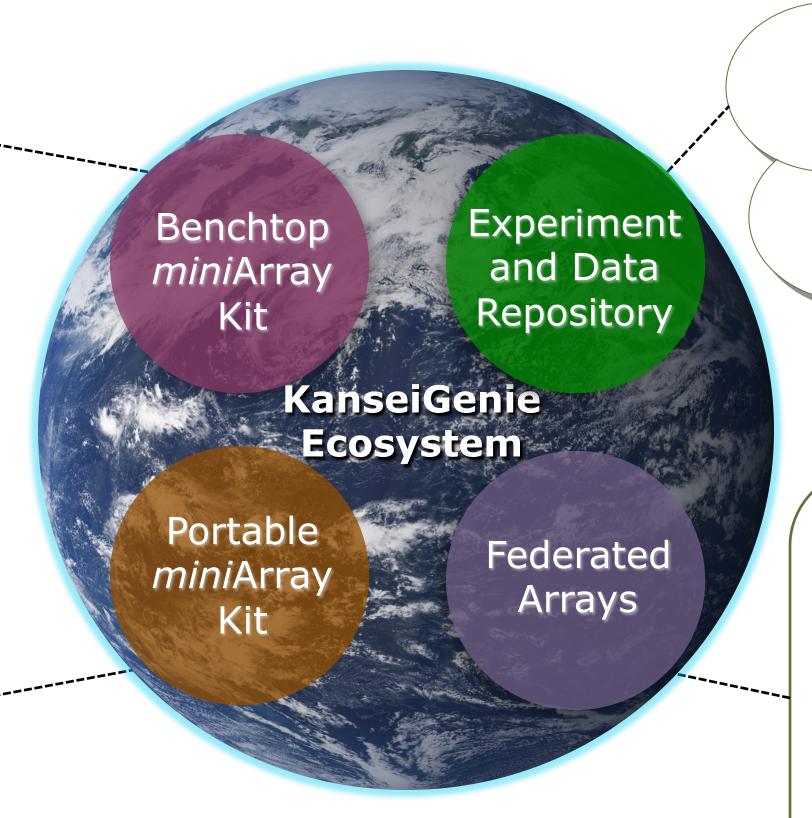
STEM Experiments leveraging Sensor Kits and GENI

- Quickly stand-up classroom testbeds with laptops
- Hands-on science education and sensing without writing software
- Motes participate as GENI resources
- Facilitate research in real world sensing

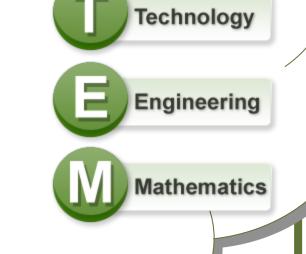


- Hand-held kits
- Visit remote sensors
- Centrally control experiments running "in the wild"
- Mobility, delay-tolerant testing
- Hand-held visualization





- Provide common resources
- Application repository
- Share experiment results
- Record exfiltrated data
- Coordinate world-wide experiments
- Peer support



Science

- Run large-scale experiments across arrays
- Federated management and experiments
- Programmatic interaction via web services





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