ABSTRACT

- process visual data from many distributed cameras
- provide real-time data (image or video)
- cloud-based scalable computing engine
- open to researchers, 200 registered users now

MOTIVATION

- Many network cameras stream real-time visual data 24hr to anyone connected to Internet.
- The data provides precious information about the world around us: streets, shopping malls, national parks, lecture halls ...

OPPORTUNITIES

- Millions of network cameras are deployed each year.
- Many organizations make the data available, e.g.,
  - City Streets
  - Shopping Malls
  - National Parks
  - News Stations
- The visual data can be used for many studies, e.g.,
  - Air Quality
  - Human Behavior
  - Crowd Management
  - Phenology

CHALLENGES

- Discover network cameras that stream real-time data
- Retrieve data from heterogeneous cameras

CAM²

- A general-purpose computing platform for using visual data from network cameras.
- A open system, researchers can register as users; 200 people have registered
- Sample data and analysis (moving object detection)
- CAM² can analyze visual data at large scale.
- An experiment demonstrated the ability to analyze 200 million images in 24 hours from 16,000 cameras worldwide, at one live (real-time) image every 5 seconds. 7TB data was retrieved and analyzed for detecting motion (background subtraction)
- CAM2 has an event-driven programming interface treating the heterogeneous cameras in the same way

PUBLICATIONS IN 2015

- IEEE Cloud Computing, September / October
- International Conference on Cloud Computing and Big Data
- IEEE International Conference on Cloud Computing Technology and Science (CloudCom)
- GlobalSIP (invited paper)
- IEEE International Conference on Digital Signal Processing
- Annual Conference International Association for Social Science Information Services & Technology IEEE International Conference on Multimedia Big Data

CHALLENGES

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ABSTRACT

- Create a uniform programming interface
- Manage computing, storage, and network resources to analyze the vast amount of data
- Handle data streams from worldwide distributed sources at high frame rate
- Develop vision solutions to extract valuable insight from the visual data
- Open the system to researchers for a wide range of scientific investigations

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