Demo Abstract: Real-time Heterogeneous Edge Computing System for Social Sensing Applications

Yue Zhang, Nathan Vance, and Dong Wang

Department of Computer Science and Engineering
University of Notre Dame
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Social Sensing based Edge Computing (SSEC)

- **Edge computing** pushes applications, data and computing power (services) **away from centralized servers** (e.g., cloud) by performing data processing **at the edge** of the network, **where social sensing occurs** (near the sources of data).

Advantages:

- Low latency and high responsiveness
- Low requirement on the network bandwidth

![Diagram of SSEC](image-url)
Application Task Allocation in SSEC

*When* and *Where* should computation tasks be executed?

<table>
<thead>
<tr>
<th></th>
<th>Cooperative -ness</th>
<th>Latency</th>
<th>Bandwidth Consumption</th>
<th>Computing power</th>
<th>Power Supply</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Backend Server</strong></td>
<td>Fully cooperative</td>
<td>High</td>
<td>High</td>
<td>Powerful</td>
<td>Power line</td>
</tr>
<tr>
<td><strong>Edge Device</strong></td>
<td>Non-cooperative</td>
<td>Low</td>
<td>Low</td>
<td>Limited</td>
<td>Battery</td>
</tr>
</tbody>
</table>

**Backend**

- Fully cooperative
- High latency
- High bandwidth consumption
- Powerful computing power
- Power line power supply

**Edge**

- Non-cooperative
- Low latency
- Low bandwidth consumption
- Limited computing power
- Battery power supply
Bottom-up Game-theoretic Task Allocation
Demo: Heterogenous Edge Computing Platform

Module Diagram

Hardware Setup
Thank You!

Question?