

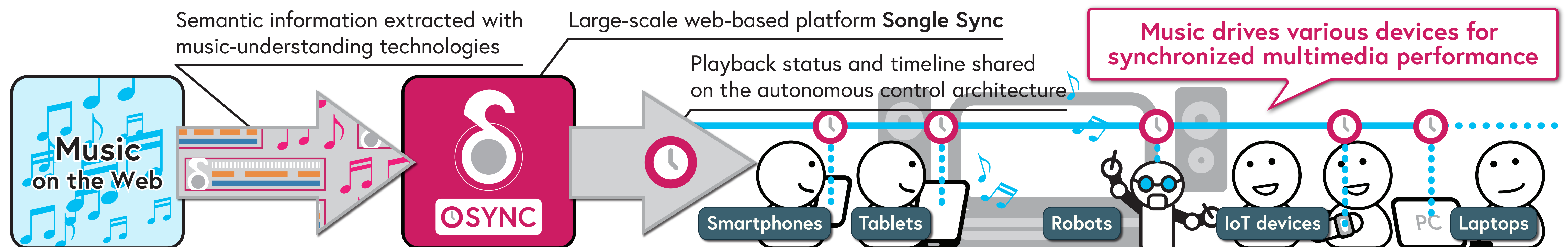
# Songle Sync: A Large-Scale Web-based Platform for Controlling Various Devices in Synchronization with Music

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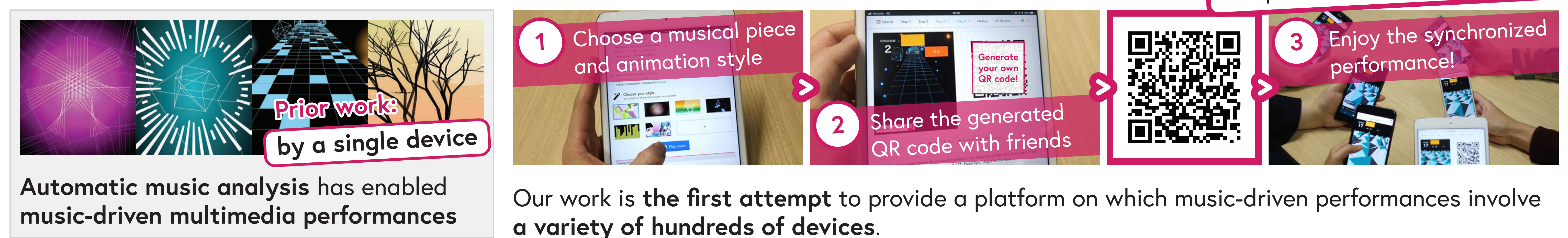
National Institute of Advanced Industrial Science and Technology (AIST)

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Songle Sync drives a variety of hundreds of devices synchronized with a musical piece on the web



## Music-Driven Multimedia Performance at Scale



### Dynamic Hardware Setup

Various Internet-connected smartphones can join the session

### Scalable Control of Devices

synchronizes >1000 devices without significant latency nor jitter

### Stable Control of Devices

works stably under challenging networking environments

### Heterogeneous Hardware Setup

Off-the-shelf mobile devices and computers

Lighting devices

Wearable devices

Robots and other actuated devices

Various JavaScript-driven devices (e.g., Raspberry Pi and Intel Edison) can be controlled since standard web technologies are utilized

### Open Platform with Development Kit

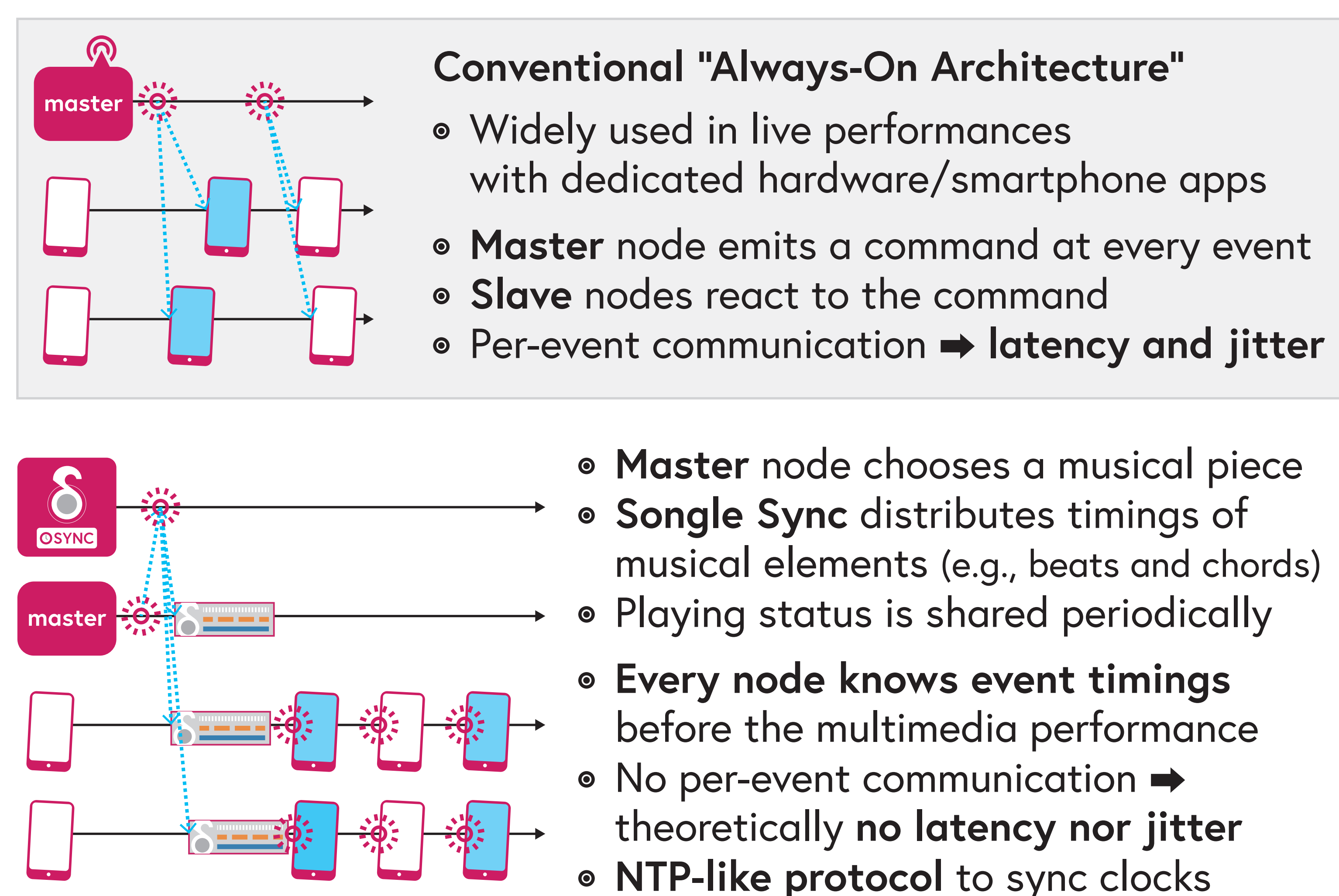
```
player.on("play", listener);  
player.on("beatEnter", listener);  
...
```

Event-driven APIs for easily controlling devices with JavaScript

- Code for one device can synchronize hundreds of devices
- No need to worry about networking and synchronization

Example programs and interactive tutorials

## Novel "Autonomous Control Architecture"



### Evaluations

**Performance Comparison**

- Always-On: 0-180[ms] delays
- Autonomous: -20-0[ms] delays
- <100[ms] jitter observed by a 960fps camera

**Deployments in the Wild**

- Demo room experiment with >110 heterogeneous hardware setup
- Live performance with >275 synchronized smartphones
- Recent event synchronized >1200 devices

**Dev. Kit Usability Test**

- 2-day hackathon with 24 university students
- MUSIC HACK DAY Tokyo

The era of "Internet of Musical Things (IoMT)" has come!

More details at <http://api.songle.jp/sync>