# Susumu Saito

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## Education

**Waseda University, Tokyo, Japan** **Apr 2017-Mar 2020 (expected)**
*Ph.D.* in Computer Science and Engineering
Graduate Program for Embodiment Informatics

**Carnegie Mellon University, Pittsburgh, PA** **Sep 2017-Mar 2018**
Visiting Student (Short-Term Scholar)
Human-Computer Interaction Institute, advised by Dr. Jeffrey P. Bigham
**Research Project**: *Crowd market research and worker tool development for improving workers' wage*

**Waseda University, Tokyo, Japan** **Apr 2015-Mar 2017**
*M.E.* in Computer Science and Engineering
Graduate Program for Embodiment Informatics
**Thesis Title:** *Crowd-Powered Condition Monitoring System Framework Enabling Early Stage Deployment*

**University of California, Davis, CA** **Aug 2015-Sep 2015**
International English and Professional Programs (completed)

**Waseda University, Tokyo, Japan** **Apr 2011-Mar 2015**
*B.E.* in Computer Science and Engineering
**Thesis Title:** *Video Recommendation System for Effectively Complementing Learners' Knowledge of Online Lecture*

**Waseda University Senior High School, Tokyo, Japan** **Apr 2008-Mar 2011**

**Oliver Wendell Holmes Junior High School, Davis, CA** **Sep 2004–Jun 2006**

## Research Projects

**Interests:** Crowd work, machine learning

1. **Improving crowd workers' wages with Artificial Intelligence**
   Studying crowd workers and designing/developing systems that are aimed to assist the crowd workers earn adequately. So far, our investigation revealed types of worker tools & online communities that workers usually benefit from, and that ensuring workers' minimum wage was quite important. We then developed a machine learning-based system that predicts working time of microtasks and calculate their hourly wages, based on other workers' histories completing other microtasks. We also established a new approach to optimize and evaluate working time prediction systems based on how workers perceive the prediction results meaningful, that would involve prediction errors.

2. **Framework design for "Ever-Evolving AI"**
   Developing a system framework that assists easy-and-fast deployment of Artificial Intelligence (AI) systems that struggle to collect data and thus to ensure its performance in real-world environments. The framework defines a hybrid system workflow for accurate pattern recognition, where the pattern recognizer infers labels of input data first and then crowd workers double-check the inferred results when the pattern recognition results are not trustful enough. The framework is now utilized in a few real-world scenarios in collaboration with cow farmers in Kagoshima prefecture, Japan, for camera-based cattle surveillance systems.

# Publications

**Journal:**

[J-1] **Susumu Saito**, Chun-Wei Chiang, Saiph Savage, Teppei Nakano, Tetsunori Kobayashi, and Jeffrey P. Bigham, "Predicting the Working Time of Microtasks Based on Workers' Perception of Prediction Errors", *Human Computation*, pp.192-219, December, 2019.

**International Conferences:**

[I-9] Saiph Savage, Chun-Wei Chiang, **Susumu Saito**, Carlos Toxtli, and Jeffrey P. Bigham, "Increasing Wages via a Strategy from High Earning Workers", In Proc. of *The Web Conference 2020 (WWW '20)*, Taipei, Taiwan, 2020.

[I-8] **Susumu Saito**, Teppei Nakano, Tetsunori Kobayashi, and Jeffrey P. Bigham, "MicroLapse: Measuring Workers' Leniency To Prediction Errors of Microtasks' Working Times", In Proc. of *the 22th ACM Conference on Computer-Supported Cooperative Work and Social Computing (ACM CSCW 2019)*, pp.352-356, Austin, TX, USA, November, 2019.

[I-7] Ryosuke Hyodo, Saki Yasuda, Yusuke Okimoto, **Susumu Saito**, Teppei Nakano, Makoto Akabane, Tetsunori Kobayashi, and Tetsuji Ogawa, "Two-stage calving prediction system: Exploiting state-based information relevant to calving signs in Japanese black beef cows", In Proc. of *the European Conference on Precision Livestock Farming 2019 (ECPLF 2019)*, pp.670-676, Cork, Ireland, August, 2019.

[I-6] Kazuma Sugawara, **Susumu Saito**, Teppei Nakano, Makoto Akabane, Tetsunori Kobayashi, and Tetsuji Ogawa, "Calving prediction from video: Exploiting behavioral information relevant to calving signs in Japanese black beef cows", In Proc. of *the European Conference on Precision Livestock Farming 2019 (ECPLF 2019)*, pp.663-669, Cork, Ireland, August, 2019.

[I-5] **Susumu Saito**, Chun-Wei Chiang, Saiph Savage, Teppei Nakano, Tetsunori Kobayashi, and Jeffrey P. Bigham, "TurkScanner: Predicting the Hourly Wage of Microtasks", In Proc. of *The Web Conference 2019 (WWW '19)*, pp.3187-3193, San Francisco, CA, USA, May, 2019. **[Best Poster Honourable Mention (0.8%)]**

[I-4] Toni Kaplan*, **Susumu Saito***, Kotaro Hara, and Jeffrey P. Bigham, "Striving to Earn More: A Survey of Work Strategies and Tool Use Among Crowd Worker", In Proc. of *the 6th AAAI Conference on Human Computation and Crowdsourcing (HCOMP 2018)*, pp.70-78, Zurich, Switzerland, July, 2018. (* Equal contribution)

[I-3] Kazuya Ueki, Kotaro Kikuchi, **Susumu Saito**, and Tetsunori Kobayashi, "Waseda at TRECVID 2016: Fully-automatic Ad-hoc Video Search", In notebook paper of *the TRECVID 2016 workshop*, Gaithersburg, MD, USA, November, 2016.

[I-2] **Susumu Saito**, Teppei Nakano, Makoto Akabane, and Tetsunori Kobayashi, "Evaluation of Collaborative Video Surveillance Platform: Prototype Development of Abandoned Object Detection", In Proc. of *the 10th International Conference on Distributed Smart Cameras (ICDSC '16)*, pp.172-177, Paris, France, 2016.

[I-1] **Susumu Saito**, Teppei Nakano, and Tetsunori Kobayashi, "Towards a framework for collaborative video surveillance system using crowdsourcing", In Proc. of *the 19th ACM Conference on Computer-Supported Cooperative Work and Social Computing (ACM CSCW 2016)*, pp.393-396, San Francisco, CA, USA, February, 2016.

**Domestic Conferences:**

[D-8] 沖本祐典, **斎藤奨**, 中野鐵兵, 赤羽誠, 小林哲則, 小川哲司. 映像による肉牛分娩開始検知システムの早期運用のためのクラウドソーシングを用いた誤通報抑制. 電子情報通信学会 パターン認識・メディア理解研究会（PRMU）. 東京.

[D-7] 兵頭亮介, **斎藤奨**, 中野鐵兵, 赤羽誠, 小林哲則, 小川哲司. 画像から得られる牛の身体情報に基づく分娩予兆検知. *人工知能学会 第33回全国大会*. 新潟.

[D-6] 沖本祐典, **斎藤奨**, 中野鐵兵, 赤羽誠, 小林哲則, 小川哲司. 肉牛の分娩検知システムにおけるクラウドソーシングを用いた誤通報の抑制. *人工知能学会 第33回全国大会*. 新潟.

[D-5] **斎藤奨**, 中野鐵兵, 小林哲則. TurkScanner: マイクロタスクの時給推定. *人工知能学会 第33回全国大会*. 新潟.

[D-4] 沖本祐典, 菅原一真, **斎藤奨**, 中野鐵兵, 赤羽誠, 小林哲則, 小川哲司. 牛の分娩予兆として映像から観測可能な状態の検知. *人工知能学会 第32回全国大会*. 鹿児島.

[D-3] **斎藤奨**, 中野鐵兵, 小林哲則. クラウドソーシングを用いた協調型ビデオ監視システムフレームワー

クの提案．*第 78 回情報処理学会全国大会*．埼玉．

[D-2] **斎藤奨**，中野鐵兵，小林哲則．クラウドソーシングを用いた協調型ビデオ監視システムのプロトタイプ設計．*2016 年電子情報通信学会全国大会*．福岡．

[D-1] **斎藤奨**，小林哲則．学習者の知識補完のためのオンライン講義コンテンツ連携フレームワーク．*情報処理学会 コンピュータと教育研究会 132 回研究発表会*．福井．

## Patent

[P-1] Japanese Unexamined Patent Application Publication No. 2016-165131, 2016-08-25.

## Fellowship

- **Graduate Program for Embodiment Informatics** (Apr 2015-Mar 2019)
- **JSPS Researcher Fellowship (DC2)** (Apr 2019-Mar 2021)

## Conference Volunteering

- **CHI 2018** Student Volunteer
- **CHI 2017** Student Volunteer
- **SIGGRAPH Asia 2016** Student Volunteer
- **SIGGRAPH Asia 2015** Student Volunteer

## Work Experience

**General Electric, Tokyo, Japan** **Feb 2016–May 2016**

Global Research Intern

**Jobs:** *Market research on additive manufacturing, IoT platform development.*

- Investigated on the market of additive manufacturing (3D printing) of ceramics and metals, for one of GE's future business plans and strategies.
- Developed video surveillance system prototype built on *Predix*, the industrial IoT platform of powered by GE. On this prototype, automated detection and alerting function based on the idea of my crowd-powered condition monitoring system has been implemented by a simple face recognition algorithm followed by crowdsourcing verification. This prototype suggested a new way to divert the platform not only into industrial usage but also into in-home and in-office usage.

**Nagase Brothers Inc., Tokyo** **Jul 2013–Feb 2014**

Part-Time Programmer

- Won a Rookie Award for contributing to the company's track record with web designing.
- Lead a web programming team that maintained/designed websites accessed by over 1M people in one month.

## Skills

Microtask Crowdsourcing Design / Machine Learning System Development / Web (Server) Programming / Computer-Aided Design

**Programming languages:** Python (Django, Flask, Pandas, Scikit-learn, Jupyter Notebook), JavaScript (jQuery, Node.js, Meteor), PHP (CakePHP), HTML5/CSS, Matlab, C++, Java, SQL

## Languages

**Japanese:** Native

**English:** Professional (TOEIC: 945)