SIGPX #6

Special Interest Group on Programming Experience

http://sigpx.org

The University of Tokyo

March 2, 2019

Chairs: Jun Kato (AIST), Hidehiko Masuhara (Titech)

Association for Computing Machinery

SIGCHI special interest group computer human interaction Japan Chapter

Today’s schedule

- 11am – introduction Jun Kato, AIST
- 11:10am – self introductions
- 11:40pm – talk by Isamu Hasegawa, SQEX
- ~~12:10pm~~ **12:25pm** – talk by Luke Church, Univ. of Cambridge
- 12:55pm – short talk by Jun Kato **and wrap up**
- ~~13:00pm – wrap up~~

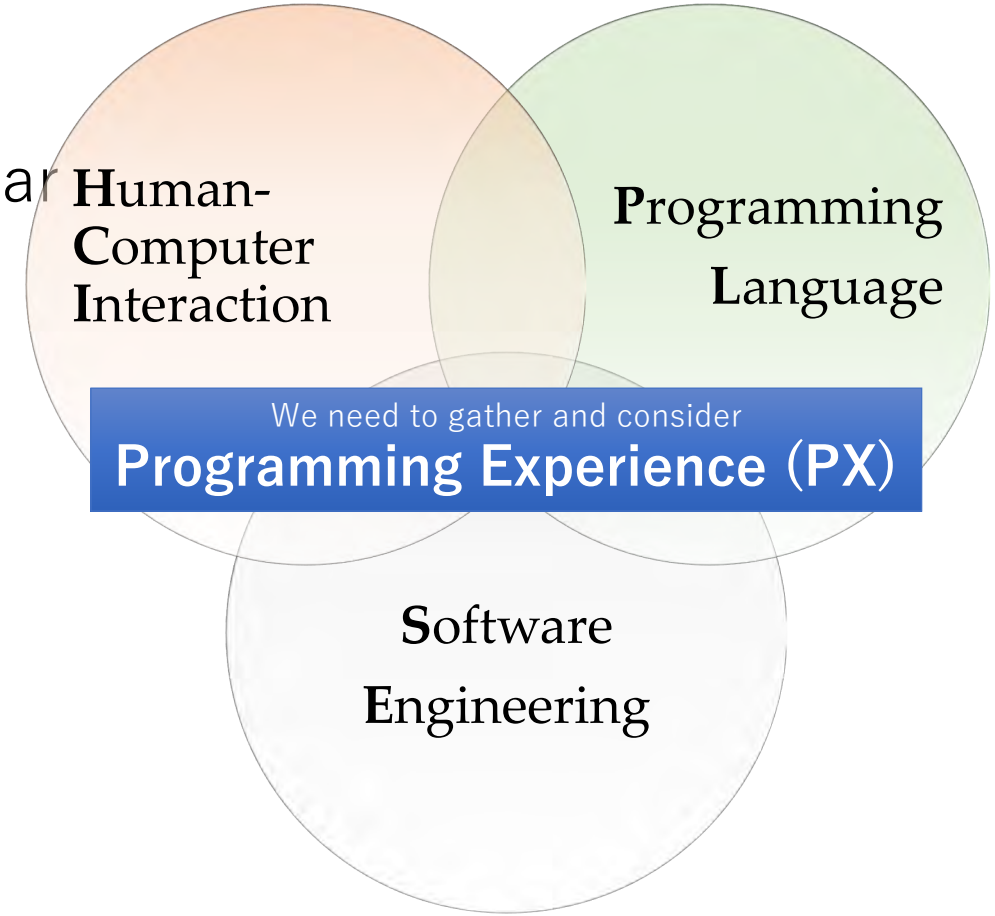
PX – why now?

-'80 Users = Programmers

⋮

'20- Programming Education gets popular

- **Motivation for PL research**: Mere improvements in PL are not sufficient to support exploratory programming
- **Motivation for HCI research**: Support for the entire workflow requires more than mere toolkit design – IDE design
- **Motivation for industry**: e.g. Y Combinator Requests for Startups (Aug. 2015) "**Programming Tools**" – Software developers are shaping more and more of our daily lives



What is your expertise?

Research Domains:

- ヒューマンコンピュータインタラクション Human-Computer Interaction
- プログラミング言語 Programming Language
- ソフトウェア工学 Software Engineering

Methodologies:

- 実装が得意 Implementation Techniques
- 調査や評価実験が得意 Surveys & Evaluations
- 商業化や教育などの啓蒙活動が得意 Case Studies & Education

SIGPX as a collective intelligence!

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Not a single person can cover this

Share your knowledge and do the right stuff

Short recap on the past SIGPX

SIGPX #6

SIGPX #1

- Venue: Tokyo Institute of Technology
- 2/27/2016 (Sat)
- 35 attendees from both academia and industry
- Presentations in the context of startups, education, HCI, PL, SE

SIGPX #2

- Venue: 31F seminar room C+D, Microsoft Japan Tokyo
- 8/7/2016 (Sun)
- 30 attendees mostly from academia
- Presentations in the context of HCI, PL, SE including reports from international conference attendees

SIGPX #3

- Venue: Tokyo Institute of Technology
- 7/8/2017 (Sat)
- 10 attendees despite the short notice, including those from abroad
- Presentations in the context of HCI, PL, SE

SIGPX #4

- Venue: 4F Room 242, Eng. Bldg. #2, The University of Tokyo
- 3/2/2018 (Fri)
- Around 20 attendees
- Presentations regarding social coding, live programming, and development support

Special Issue on

Emerging Research on Programming Experience: From Language Design to Industrial Applications

- Special Issue in IPSJ Journal “Information Processing” Vol.58, No.11
- Covered recent work in programming experience
- Jun Kato, Hidehiko Masuhara (AIST, Titech), Sean McDirmid (Y Combinator Research HARC), Taka Umada (The University of Tokyo), Ryo Suzuki (University of Colorado Boulder), Tsubasa Yumura (NICT), Kazuo Ichikawa (The University of Tokyo), Katsuhiko Gondow et al. (Titech, Cybozu), Hidetake Uwano(NIT, Nara College)

See https://sigpx.org/en/ipsj2017/

SIGPX #5

- Venue: 2F Room 202, Sci. Bldg. #7, The University of Tokyo
- 12/3/2018 (Mon)
- Around 20 researchers including over half of students
- Presentations regarding domain-specific PX, machine learning & programming, and learnable programming

SIGPX #6

- Venue: (A secret venue in) The University of Tokyo
- 3/2/2019 (Sat)
- Around 10 attendees from all over the world
- Presentations regarding PX in gaming industry, problem solving, and recap on the international workshop

PX studies in HCI

SIGPX #6

なんで別れたのか Why we got separated

- 昔はみんな一緒だった HCI, PL, SE were all the same
- PC, GUIの登場で「エンドユーザ」が生まれた The birth of “end users”

- もともとのプログラマ向け研究: **PL, SE**
- エンドユーザ向けプログラミング研究: **VPL, PBE**
- エンドユーザ向けユーザインタフェース研究: **UI, HCI**

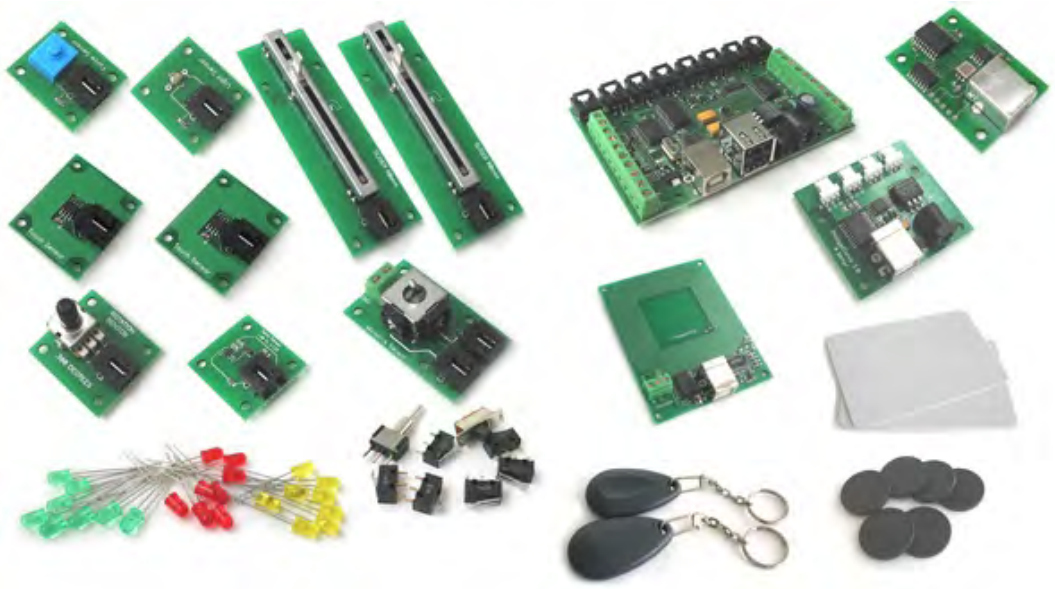
HCI研究の歴史を復習します See how HCI people have done it

HCIにおけるPX 3類型 PX studies in HCI

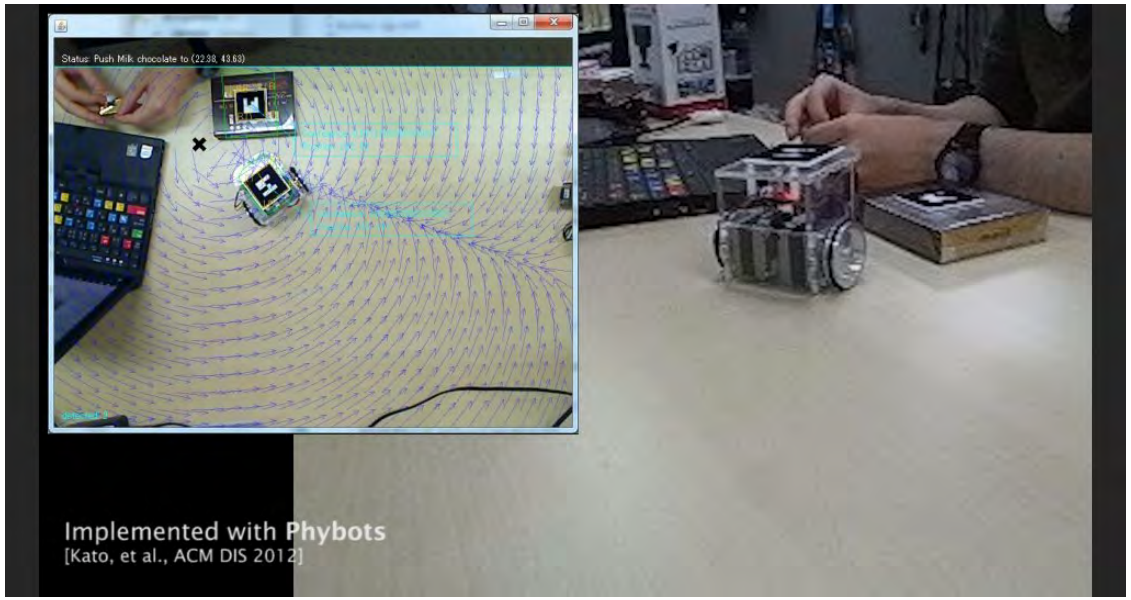
1. ユーザインタフェース設計用ツール, ツールキット, API設計
   Tools, toolkits, API designs for developing user interfaces
   - What are good abstractions of concrete user interfaces?
   - What are good tools for people to design user interactions?
2. エンドユーザプログラミング, プログラマ用ユーザインタフェース
   End-user programming, more intuitive “professional” programming
   - How can we make programming languages and tools better?
3. 統合開発環境
   Programming environments for developing applications
   - What are good environments for people to design user interactions?
   - More emphasis on the workflow

1. ユーザインタフェース設計用ツール, ツールキット, API
Tools, toolkits, API designs for developing user interfaces

- Phidgets [UIST 2001] — GUIウィジェット（Widget）の物理デバイス版
- Phybots [DIS 2012] — 平面上の移動をGUIのように指示できるAPI



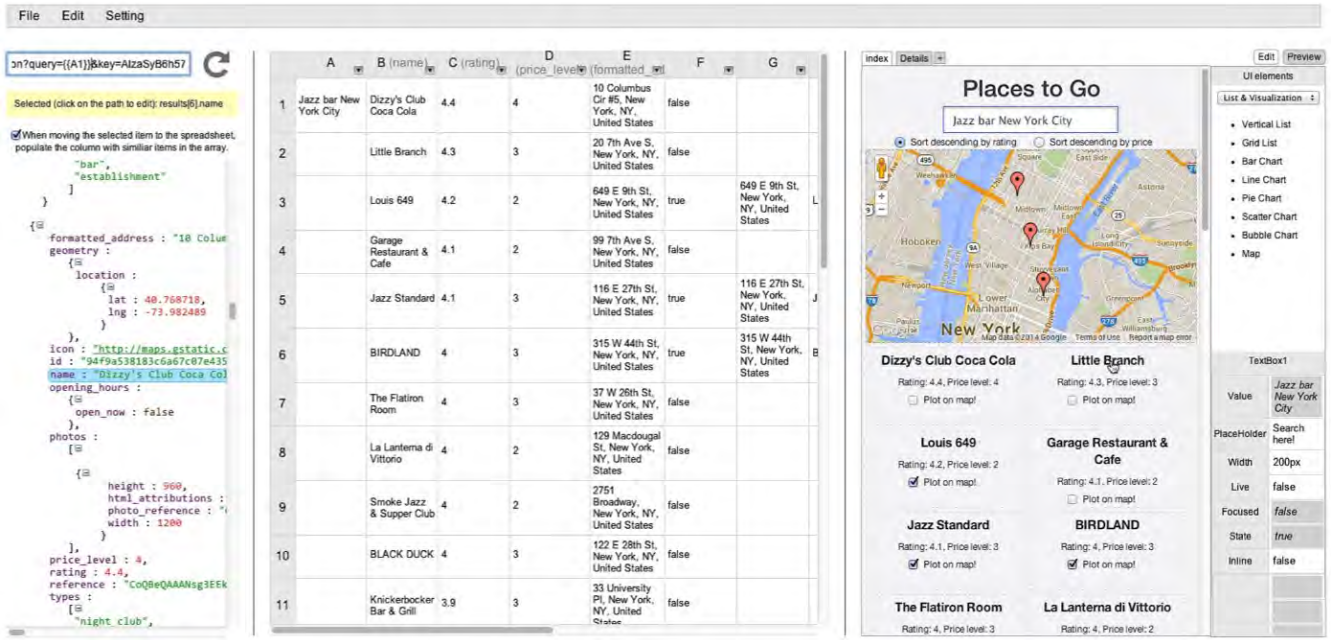
https://www.youtube.com/watch?v=q0gJMDCrkZM



https://www.youtube.com/watch?v=8pSLDYBQg5I

2. エンドユーザプログラミング, プログラマ用UI
End-user programming, better UI for programming

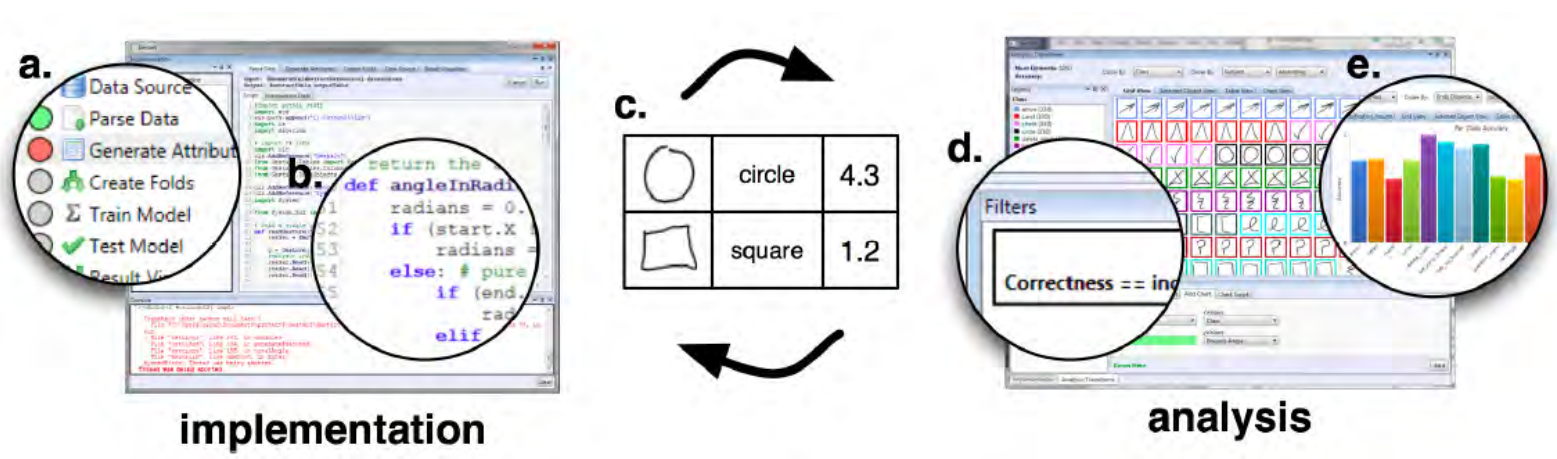
- Gneiss [CHI 2015] — スプレッドシートで時系列データを扱う拡張UI
- Blueprint [CHI 2010] — 実例のテンプレートを入力できるコード補完

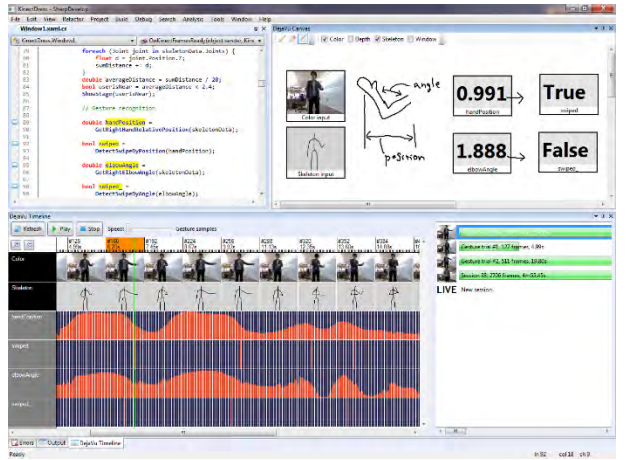


3. 統合開発環境
Integrated development environments

ワークフロー全体を支援するため複数のツール・UIを複合

- Gestalt [UIST 2010] — 機械学習のデータ編集とテストケース管理
- DejaVu [UIST 2012] — 画像処理の時系列可視化とテストケース管理
- Picode [CHI 2013], TextAlive [CHI 2015], f3.js…





HCIにおけるPX PX studies in HCI

- ユーザインタフェース・アプリケーションの進化と共にあった
  They have been always with evolutions of UI/applications
- 重要性が増している Fundamental changes in need as of today
  - データ構造の複雑化 More complex data structure
  - インタラクションの複雑化 More complex interaction modalities
  - とくに実世界系アプリの台頭 e.g., VR/AR/physical computing
- ツール単体やAPI設計「だけ」では研究になりづらい今日この頃
  Sole tool development or API design considered as minor contributions
  - もう、そういう（商用）ツール・ライブラリあるよ “You can do it already with …”
  - ラップしただけ? すごみがたりない “You made a wrapper library – so what?”

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