Workflows

HCS Fall 2015
Why workflows?

The wave of the future!
Why workflows?

The wave of the future!

...and the present
Why workflows?

The wave of the future!

...and the present

...and the past
Unit of human computation

t := 0;
initialize: \( P(0) := \{ \bar{a}_1(0), \ldots, \bar{a}_\mu(0) \} \in I^\mu; \)
evaluate: \( P(0) : \{ \mathcal{A}(\bar{a}_1(0)), \ldots, \mathcal{A}(\bar{a}_\mu(0)) \} ; \)
while not \( \{ P(t) \} \) do // Reproductive Loop
    select: \( P'(t) := s_{\Theta}(P(t)); \)
    recombin: \( P''(t) := \otimes_{\Theta_r}(P'(t)); \)
    mutate: \( P'''(t) := m_{\Theta_m}(P''(t)); \)
    evaluate: \( P'''(t) : \{ \mathcal{A}(\bar{a}_1'''(t)), \ldots, \mathcal{A}(\bar{a}_\mu'''(t)) \} ; \)
    replace: \( P(t + 1) := r_{\Theta}(P'''(t) \cup Q); \)
    <communication step> SYNCHRONIZED ASYNCHRONOUS
end while

some algorithm
crowd person
Traditional Workflow

Requester Posts HIT Group to Mechanical Turk

HIT

Data Collected in CSV File

Data Exported for Use

Sanjay Kairam
Iterative Improvement & Voting

Turkit & Sanjay Kairam
Handwriting Recognition

- **Final Version:**
  - You (misspelled) (several) (words). Please spellcheck your work next time. I also notice a few grammatical mistakes. Overall your writing style is a bit too phoney. You do make some good (points), but they got lost amidst the (writing). (signature)
Microsoft Word
C# and Visual Studio Tools for Office

Soylent is a prototype crowdsourced word processing interface. It focuses on three main tasks: shortening the user's writing, proofreading [...]

User selects text

Find Fix Verify ...

shorten(text)

Displayed to the user

Soylent, a prototype crowdsourced word processing interface, focuses on three tasks: shortening the user's writing, proofreading [...]

Find
"Identify at least one area that can be shortened without changing the meaning of the paragraph."

Find overlapping areas (patches)

Fix
"Edit the highlighted section to shorten its length without changing the meaning of the paragraph."

Soylent, a prototype...

Randomize order of suggestions

Verify
"Choose at least one rewrite that has significant style errors in it. Choose at least one rewrite that significantly changes the meaning of the sentence."

- Soylen is a prototype...
- Soylen is a prototype...
- Soylen is a prototype...
- Soylen is a prototype test...

return(patches)
CrowdForge

Figure 1: Overview of framework for splitting up and recombining complex human computation tasks.
Figure 2: The PlateMate system. Work travels between stages and Human Intelligence Tasks (HITs) along the black arrows, starting from the input on the left and concluding with the output on the right. The system takes submitted photos and creates Tag tasks to annotate these photos with boxes. Each box becomes the input to a series of Identify tasks which end with a list of foods from a commercial food database. Each individual food is then input to a Measure task, which produces a unit and amount. Dashed boxes represent optional stages, which may be skipped during routing.
Crowdsourcing Crowd Workflows?

Turkomatic: Automatic, Recursive Task and Workflow Design for Mechanical Turk

Anand Kulkarni, Matthew Can, Björn Hartmann
So, we can do anything now…

right?
So, we can do anything now…

right?

… right??
So, we can do anything now…

right?

… right??

Sort of!
Cascade: Finding Taxonomies
Cobi: Scheduling Conferences
Shepherding the Crowd

**No assessment**
- work on task
- submit work

**Self assessment**
- work on task
- assess & edit own work
- submit work

**External assessment**
- work on task
- review feedback and edit task
- submit work

external assessment
Back to the high level view...
Task Decomposition
Task Decomposition
Task Decomposition
Task Decomposition
How much help is too much?
Potential Effects on Tasks

Of Task Decomposition
Example: Task Decomposition

Hye Fred,

It was greate talking with you you the otter day! We should definitely trie to get that proposal submitted soon,

Thanks Sally!

- J.D. Officewoker
Hye Fred,

It was great talking with you the other day! We should definitely try to get that proposal submitted soon.

Thanks Sally!
- J.D. Officeworker
Example (v1): Worker 1

Hye Fred,

It was greater talking with you you the otter day!
We should definitely *try* to get that proposal submitted soon.

Thanks Sally!

- J.D. Officeworker
Example (v1): Worker 2

We should definitely *try* to get that proposal submitted soon.

Thanks Sally!

- J.D. Officeworker
Example (v2): Worker 1

Hye Fred,
Example (v2): Worker 2

It was great
Example (v2): Worker 3
talking with you
Example (v2): Worker 4
Example (v2): Worker 5

day!
Example (v2): Worker 6

We should
Example (v2): Worker 7

definitely trie
Example (v2): Worker 8

proposal
to get that
Example (v2): Worker 8

submitted soon,
Example (v2): Worker 10

Thanks Sally!
- J.D. Officeworker
Hye Fred,

It was great talking with you you the otter day! We should definitely try to get that proposal submitted soon,

Thanks Sally!
- J.D. Officeworker
Potential Effects on People

Of Task Decomposition
Measuring the Effect of Context
Measuring the Effect of Context
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Measuring the Effect of Context
Measuring the Effect of Context
Measuring the Effect of Context
We now interrupt this regularly scheduled program to bring you...

Pig(s). In boots.

( Brownie points to anyone who gets the “Three Different Ones” Pink Floyd reference! )
Measuring the Effect of Context
Measuring the Effect of Context

Find the store.
Measuring the Effect of Context

Find the store.
Measuring the Effect of Context

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Measuring the Effect of Context
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<th>Completion Time (seconds)</th>
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<th>Long Wait (CLong)</th>
<th>Context Image (Clmg)</th>
<th>Context Map (CNew)</th>
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<td>10.8</td>
<td>17.2</td>
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Measuring the Effect of Context

Completion Time (seconds)

- Baseline: 8.5
- Short Wait (CShort): 10.8
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Measuring the Effect of Context

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