KIT
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StoryGraphs
Details, Results and Applications

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Project page (data and code)
http://cvhci.anthropomatik.kit.edu/projects/mma

cv:hci

StoryGraphs – Implementation Details

- character presence in scene
  - reduce influence of automatic person identification errors
  - minimum number of frames required to flag as present

- co-occurrence score p_{c_i,c_j}, between characters c_i and c_j
  - geometric mean of frame counts within scene

- initialization is important
  - objective not convex
  - agglomerative clustering of characters, based on $1 - p_{c_i,c_j}$

- optimization $1 \leq x_t^c \leq N_C$
  - Matlab's *fmincon* with given gradients

Scene detection – Implementation details

- Forward computation matrix update equations

Add shot to same scene

$$D_{i,j,k} = D_{i,j-1,k-1} + \alpha(k)(\phi(\mathcal{C}(j,\mathcal{P})) + T_{j,\mathcal{P}})$$
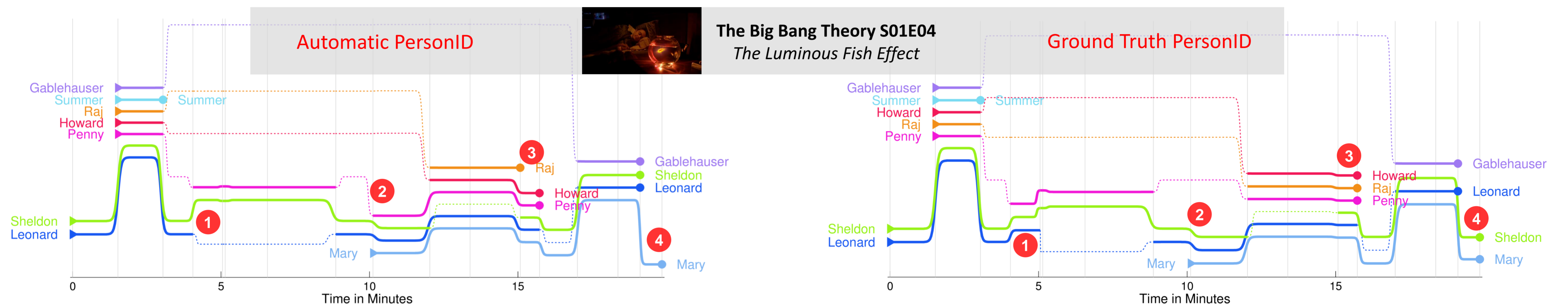$$\forall (i,j,k) \in [1..N_{sc}, 1..N_{sh}, 2..N_l]$$

$k \geq 1$, score of adding shot to *same* scene is high when there is a *high* shot similarity and shot threads exist

Add shot to new scene

$$D_{i,j,1} = \max_k \left[D_{i,j-1,k} + \beta(k)(1 - \phi(\mathcal{C}(k,\mathcal{P})) + \hat{T}_{k,\mathcal{P}}) \right]$$

$k = 1$, score of adding shot to *new* scene is high when there is a *low* shot similarity and *no* threads exist

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Auto vs. Manual PersonID

Automatic PersonID — Ground Truth PersonID

The Big Bang Theory S01E04
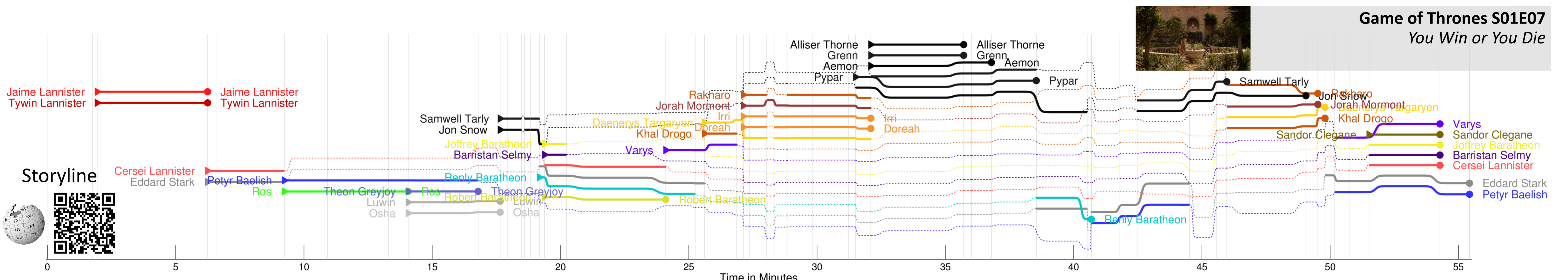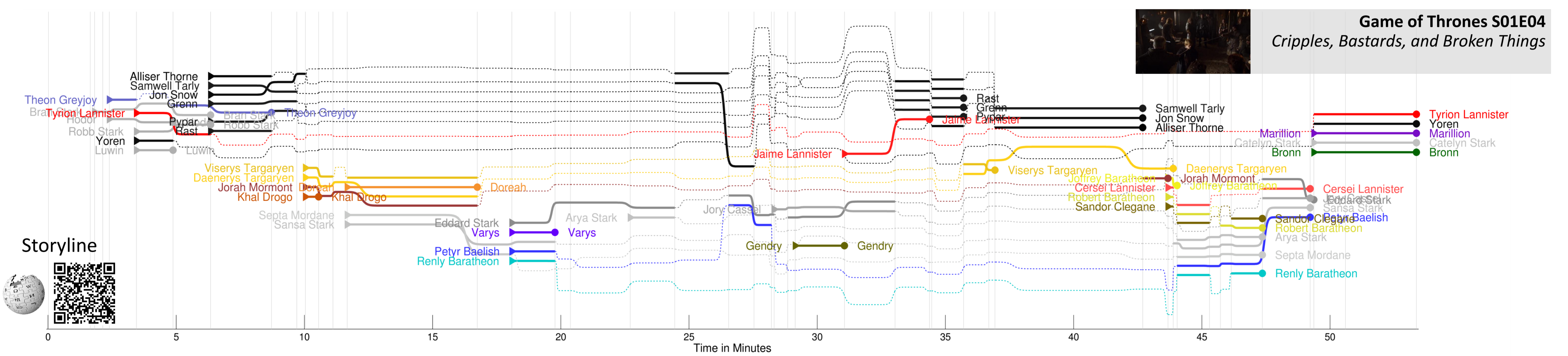*The Luminous Fish Effect*

Plot summary: Sheldon is fired from his job as a physicist at the university when he insults his new boss Dr. Eric Gablehauser. His change of circumstance sends him into a downward spiral of depression which results in working on developing luminous fish for n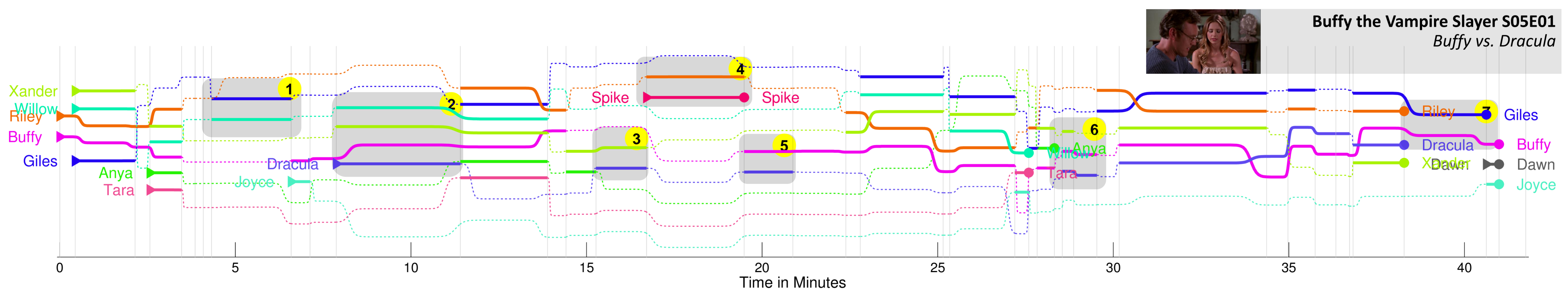ightlights and buying a loom for himself. Leonard tries to cure him by sending for Sheldon's mom, Mary Cooper. When she arrives for a visit, the men realize she is completely the opposite of what they expected: she is sweet and down-to-earth, if culturally ignorant, and a devout Christian, but nevertheless, a really good and loving and caring mother, as they have not expected. After waiting it out, Mary finally forces Sheldon to apologize, and he is given his job back after she flirts with Dr. Gablehauser. As Mary is a widow, Sheldon asks if Dr. Gablehauser will be his new daddy and his mother replies, "We'll see..." *(source: Fan Wiki)*

Complex StoryGraphs – many Characters

Game of Thrones S01E04
Cripples, Bastards, and Broken Things

Storyline

Game of Thrones S01E07
You Win or You Die

Storyline

Event Annotation

Buffy the Vampire Slayer S05E01
Buffy vs. Dracula

Storyline: While chasing a vampire in a cemetery, Buffy meets Dracula, who has come to Sunnydale to meet her. Buffy feels proud with the revelation of the greatest vampire in the world. Meanwhile, Giles secretly tells Willow that he will return to England since Buffy does not need his service of watcher anymore. Dracula turns Xander into his slave, and during the night, he visits Buffy, bites and put her under his thrall. Buffy hides the bite with a scarf and becomes powerless and seduced by the dark prince, who promises to disclose to her the darkness of her powers and increase them. *(source: IMDb)*

Main Events:
1 – Giles reveals to Willow his plans to leave Sunnydale
2 – Buffy encounters Dracula while patrolling

3 – Dracula charms Xander and turns him into his slave
4 – Riley meets Spike to gather more information about Dracula
5 – Dracula bites Buffy and puts her under his thrall
6 – Xander takes Buffy to Dracula's castle
7 – Buffy admits to Giles that she needs his help

KIT – University of the State of Baden-Wuerttemberg and
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