A Game of Thrones Companion: Orienting Viewers to Complex Storyworlds via Synchronized Visualizations

Abstract
The merger of television and digital technology allows TV producers to author increasingly complex narratives, which pose new challenges for modern audiences. The prototype presented here is targeted at viewers of HBO’s Game of Thrones and utilizes manipulatable, tightly synchronized spatial visualizations to concretize complex character relationships. A preliminary user study was conducted, utilizing the less tightly synchronized, non-diagramatic HBO Go application as an experimental control. Results show that users were able to more accurately identify character relationships after watching segments of the TV drama with the companion app prototype.

Author Keywords
Second screen companion design; narrative; agency; interactive television.

ACM Classification Keywords
H.5.2 Information interfaces and presentation: User Interfaces; User-centered Design.
Introduction
The integration of television and digital technology affords designers the tools to cultivate a more synchronized, immersive experience for viewers [21, 22]. The proliferation of on-demand streaming services such as Netflix and Hulu continue to shape the habits of TV viewers. Once firm delineations between serial and episodic narratives begin to blur [13]. Viewers prioritize narrative consistency, as back-to-back viewing—or “binge watching”—renders failures of continuity especially apparent. It is common for contemporary television shows to feature a dozen or more frequently recurring characters, and plots that arc across multiple seasons [14]. If viewers are to successfully follow narrative developments from episode to episode, contemporary storyworlds demand close attention.

Jenkins [11, 12] remarks on the possibilities of interactive television for enrichment and sharing, citing examples of media convergence where content is “spreadable” and consistent across mediums and platforms, while remaining open to fan participation. Mittell [15] countervails Jenkins’ “spreadability” with his own term, “drillability”. Whereas highly spreadable media prioritizes shallow engagements that appeal to broad audiences, highly drillable media encourages a mode of “forensic fandom”, a vertical probing of the text’s complexities. Murray [16] calls this testing of the narrative world as “active creation of belief,” and has predicted such increased participatory, immersive viewing as a result of the convergence of television and computation.

That viewers are attracted to narrative complexity is not surprising. Cognitive science has established that in order to better comprehend the real world, humans build cognitive structures that represent the events of their lives via models similar to those encountered in narrative [2]. Narrative form in media is increasingly understood as an extension of cognitive schema building [10, 23]. Thus the ability to abstract and retain story patterns is requisite to experiencing the pleasures afforded by these dense storyworlds: their encyclopedic [16], ergodic [1, 5] and immersive [19] qualities, their demand for nontrivial effort, and the subsequent reward of additive comprehension [11]. Character relationships are of particular importance, as cognitive scientists have shown that audiences rely on the intentions behind characters’ actions as a means of comprehending narrative [7, 8].

Second screen devices provide an already widely adopted platform for disseminating synced, contextualized information without obstructing the primary media [18]. Likewise, viewers already engage in sites of community participation, where fans author their own summaries of plot points, hold debates and self-police to a careful standard of accuracy [15]. Viewers utilize digital devices to more closely engage with these storyworlds, to browse through catalogs of characters, locations and plot points. Cesar and Bulterman [3] categorize four major uses for second screen interaction with television: to control, enrich, share, and transfer conventional television content. However, design guidelines usually focus on expanding TV’s social accommodation [6, 9]. The prototype presented here aims to explore the potential of second screen companions for enhancing retention and narrative comprehension of character relationships, in order to identify design issues and guidelines for creating companion apps that support complex storyworlds.

Previous Work
Historically, discussions of interactive television often reference a tension between “lean back” and “lean
Figure 2: Sansa’s portrait sits at the circle’s origin. Characters present or alluded to in the current scene surround her, mostly enemies and nearly all loyal to house Lannister. The scene depicts Sansa’s interrogation by Joffrey, sadistic king and murderer of Sansa’s father.

Technical Implementation:
GoTC was developed using HTML5, CSS3 and JavaScript. All animations were handled through the HTML5 canvas with the support of the Kinetic.js library. To sync playback across first and second screens, GoTC utilized Node.js and http sockets. Timing information was stored as JSON objects. Synchronization was achieved by utilizing the timecodes of the TV drama’s streaming playback, allowing the prototype to fit any synchronization technique.

Our past work [17] found that a companion app for the long-form television show Justified enhanced comprehension for new viewers and supported their understanding of character relationships. User responses to the Justified prototype led to several design recommendations, including minimizing interruptions, focusing on characters, and synchronizing the application to the show’s current context. The prototype presented here, Game of Thrones Companion (GoTC), expands our inquiry to another storyworld, HBO’s Game of Thrones, in order to assess the generalizability of second screen companions across genres and at a much higher level of narrative complexity. Secondly, this study incorporates the HBO Go app as a control during usability testing. This study also compares the effectiveness of second screen companions for both naïve and experienced viewers.

A Game of Thrones Companion
The design of GoTC aims to support the retention of character relationships for both naïve and experienced users. HBO’s Game of Thrones was selected as our target due to the rich complexity of its storyworld: indeed, the Wikipedia entry for Game of Thrones lists 38 major characters, all of whom reappear throughout show’s current five seasons; by contrast, Breaking Bad includes 11 major characters, whereas Justified includes 8.

Also, Game of Thrones’ Westeros presents itself as eminently “drillable” [15], rewarding attentive fans with a wealth of cohesive, consistent narrative details. Game of Thrones exemplifies Jenkins’ and Rose’s conception of convergence, and unsurprisingly, engenders a forensic fervor among fans, a hunger to drill into the details of Westeros. The Game of Thrones Wiki lists 38 major characters, whereas Justified includes 8.

The HBO Go second screen application focused on Game of Thrones provides viewers with text and image annotations synchronized with particular moments within a television drama, including condensed character bios, related plot points, and behind-the-scenes anecdotes. Viewers may choose to pause the show and examine these annotations, or watch the show uninterrupted and review the annotations separately. Despite the potential for added context available through synchronization, character descriptions remain decontextualized, lacking any anchor to the particular episode or dramatic moment. Additionally, the frequent foregrounding of production information (e.g., set-design, actor commentary) presents a breach of the fourth wall.

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forward” experiences. Expanded interaction poses an attractive endeavor for industry leaders, who see opportunities for additional revenue and increased audience engagement. Yet, evidence suggests that viewers prefer modes of interaction that do not require mastery and are therefore less susceptible to user error [4]. Network-affiliated applications have thus favored single button interactions, usually in the form of multiple choice trivia with immediate feedback. Designers employ synchronized second screens as a means of eliciting user input through polls, expressions of character allegiance and guesses at future developments [4, 20].

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Design Considerations

GoTC utilizes an iPad as a second screen device. It presents synchronized visualizations of character relationships in a highly legible arrangement. Ideally, these visualizations should orient users “at a glance,” be ignorable when not required, and allow users to drill down or to shift attention to follow story threads across the series’ wealth of characters. In order to meet these aims, the GoTC app exploits tight temporal synchronization to focus users’ attention on the characters and relationships most relevant to the current scene. As characters are introduced into the scene, their respective portraits appear on the second screen. To maximize legibility, information is mapped onto spatial dimensions (see figure 1).

At any time, users may drag a major character’s portrait to the circle’s center, which shifts focus onto the selected character. The concentric circles merge into one, character portraits surround the focal character, and the circle’s “house” sectors shrink and grow according to the new arrangement. Here, a character’s distance from the center signifies the tenor of his/her relationship with the focus character. These relationships are composed of a single abstracted value, which categorizes relationships into five types. From most amiable to most antagonistic, they are: ally, friend, neutral, rival, and enemy. The characters whom the focal character considers allies are positioned closest to the center, while those considered enemies are positioned farthest. Finally, icons are used to highlight key relationships such as betrothal and parentage.

Since well-constructed storyworlds invite users to drill down in pursuit of encyclopedic narrative pleasure, GoTC includes filters for exploring the story structure without being overwhelmed. The scene filter (on by default) narrows the presented characters to those present or alluded to in the current scene. The house filter, when enabled, narrows presented characters to those belonging to the focal character’s house. The relationship slider allows users to narrow presented characters to those within a desired relationship range. These filters may be toggled on and off in any configuration (see figure 3).

Preliminary Usability Testing

The preliminary user study involved 26 participants, each with varying degrees of familiarity with *Game of Thrones*. Participants watched four scenes from the fourth episode of season two, *Garden of Bones*, with each scene chosen for its diversity of characters and dramatic appeal. Each participant was provided with either the GoTC or the HBO Go app to utilize during testing. To allow users a chance to peruse their respective apps for further information, two-minute breaks were provided between each scene. After watching the four scenes, participants were asked to complete a 20-question questionnaire.

The questionnaire focused on: (1) gauging participants’ familiarity with *Game of Thrones*; (2) measuring participants’ ability to identify which major and minor characters were present in a given scenes, as well as the nature of those characters’ relationships; and (3) obtaining evaluations of the apps’ usefulness for enhancing understanding and recall. Based on their self-reported familiarity with *Game of Thrones*, participants were divided into naïve and experienced groups. These groups were further divided into a GoTC and HBO Go group, for a total of four test cases: naïve and experienced GoTC users, and naïve and experienced HBO Go users (see table 1).
For both sets of experienced users, retention was strong when identifying major characters’ presence across the four scenes; though, experienced GoTC users accurately identified the presence of a greater number of minor characters. In contrast, naïve GoTC users had significantly better recall across all four scenes when compared to naïve HBO Go users. Naïve GoTC user’s recall of major characters was just as effective over all 4 scenes as our experienced user testing groups. During the first scene, for example, naïve GoTC users were better able to comprehend the relationship between Sansa Stark, a protagonist, and Joffrey Baratheon, sadistic king and fiancé to Sansa. Participants ranked their understanding of the relationship average of 4.4 out of 5, as compared to an average of 1.2 for HBO Go users. In another case, when asked which character posed the greatest challenge to Joffrey, naïve GoTC users provided answers that more closely reflected those of the experienced groups, with Tyrion being the most popular answer. Lastly, only GoTC users were able to identify Robb Stark, who is mentioned though never physically present in the first scene. Our group also wanted to determine when users were likely to use the given application. Users could choose any combination of answers, which included “during the show”, “after the show”, “during the show”, “during breaks” and “would not use”. Again, the biggest difference was also between naïve GoTC users and naïve HBO Go users with 4 of 10 (i.e., 40%) GoTC users responding that they are likely to use the application both during the show and during breaks and only 1 of 5 (i.e., 20%) naïve HBO Go users giving the same answer. Furthermore 2 of 5 naïve HBO Go users said they would not use the application at all compared with 0% of GoTC users.

### Design Observations and Future Work

When developing the prototype, several design considerations surfaced. First, visualizations should prioritize spatial arrangement. The design of GoTC mapped the scene’s most salient information onto the spatial dimension. Character portraits appear as they arrive on scene. Major and minor characters are delineated by portrait size. To shift focus onto a character, users drag a portrait into the center; friends huddle around their ally; enemies disperse. These spatial arrangements capitalize on users’ understanding of visual language. For parts of the design that strayed from spatial cues, participants suggested shorter character descriptions. Secondly, maintaining visual consistency between first and second screens allows for more seamless transitions between screens.

Matters of spatial arrangement and abstraction present rich possibilities for future research. Synchronized visualizations may be applied to discrete narrative threads or geographical settings. Social TV apps offer unique social affordances that have yet to be integrated into narrative-focused apps. Lastly, these visualizations offer equally rich potential for non-fictional material such as televised news and historical documentaries.

### References


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Table 1: Distribution of participants across four test cases.


