Augmenting Emotional Requirements with Emotion Markers and Emotion Prototypes

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Abstract

A production-phase weakness in emotional requirements was identified and resolved during a follow-up study. The definition of emotional requirements was extended to include emotion prototypes and emotion markers. Improved practices for identifying media assets for emotional requirements were developed, enhancing their utility to the production process.

Keywords: Non-functional requirements, emotional requirements, emotion, video game.

1. Introduction

Our research program is motivated by a desire to reduce the risks in video game development. An evaluation of development processes in the video game industry identified a problem with the transition between the pre-production and production phases of game development [1]. Emotional requirements (capturing the intended emotional experience for the player) and emotional intensity maps (a graphical representation of the intended player experience within the game world) were developed [2] to improve the transition and then introduced into the development process for the game *Run the Gauntlet* by Far Vista Studios.

A follow-up investigation with the lead game designer at Far Vista Studios identified that the adoption of emotional requirements at the studio had been lower than expected. While the combination of emotional requirements and emotional intensity maps were useful to the game designer, the media production team did not find them sufficiently useful to trigger adoption – the emotional intensity maps did not indicate *how* the target emotion was to be induced or *where* the inducing elements were located.

The production team identified that some form of indicator must be placed within the game world to act as a trigger to induce the desired emotional state in the player. In response to this observation, the definition of emotional requirements was extended to include Smith's emotion markers (as triggers for the intended emotion) and the associated documentation was enhanced to include the three characteristics (cue, action, and goal) of Smith's emotion prototype [4] to provide further guidance to the media production team.

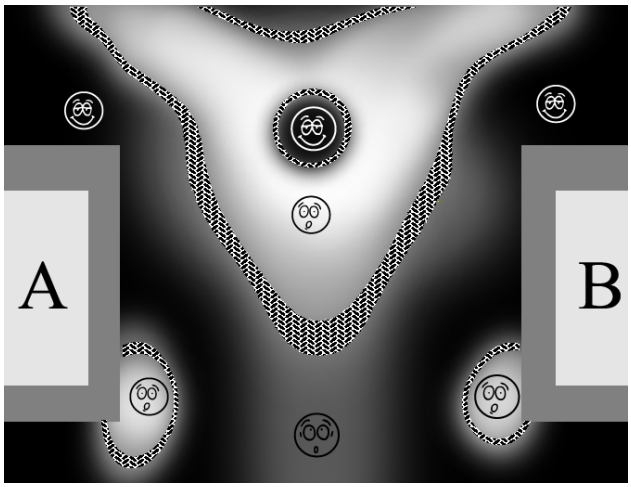

Figure 1. Sniper scenario emotional intensity map. Black fill denotes safety, white fill denotes danger, pattern fill indicates possible locations for emotion markers. Emoticons represent player emotion.

Figure 1 is a plan view diagram for a sniper scenario in the combat game *Run The Gauntlet*, constructed by the game designer using a simple graphics editor. The Sniper may take a position in the buildings marked A and B while the Runner must attempt to pass through the shaded region between the buildings. The safe zones (darker means safer) imply that there are aspects of the virtual world that make these zones safe – most likely physical constructs used as

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emotion markers. In this figure, a luminosity thresholding algorithm was used on the shaded region to identify possible locations for the emotion marker(s). These locations, identified with a pattern fill, thereby provide the location guidance for the media production team. Accompanying notes identified the nature of the cue (*e.g.* barriers to hide behind), the expected player action (hide behind the barriers), and the player's goal (to rest in safety while trying to decide what to do next).

2. Elicitation and Capture

The elicitation and capture process is as follows.

1. Create the scenario concept and capture a textual summary and a few sketches of the virtual world.
2. Iterate as necessary:
   (a) Define the gameplay experience. What actions can each player take, what assets can the players utilize, how can the players interact?
   (b) Define the artistic context, the virtual world, in sufficient detail that the definition can be given to the media department for implementation.
   (c) Capture the emotional requirements using the definition of Section 3.
   (d) Iterate as necessary, within the context of (cue, action, goal), to ensure that the desired player experience will be created:
      i. Evaluate interactions with the artistic context.
      ii. Evaluate interactions with the defined gameplay experience.

Evaluating the interactions with gameplay and artistic elements often presented opportunities to define new interactions – in essence, to invent new requirements. The following interaction patterns were identified: SPATIAL – The location of the element within the virtual world; TEMPORAL – The interaction pattern is dependent only on time, or on a (readily) discernible or deducible function that includes time; ENGINE ATTRIBUTES – manipulating the physics of the virtual world; GAME ATTRIBUTES – those aspects that are unique or defining elements of the game.

After exploring the possibilities for realizing the scenario, a pseudo-verification phase should be performed to verify that the value proposition for each artifact is sufficient to justify expending the necessary resources.

3. Specifying Emotional Requirements

An emotional requirement, a guideline that provides sufficient information about the relationship between the intended emotion and the virtual world such that the communication and specification needs of the game designer and the media production team are met, is defined as follows.

1. The intended emotion. Use of a reference list or ontology (*e.g.* [3]), standardized for the project or organization, is recommended. Emoticons, or local artwork, can be used as placeholders.
2. The artistic context, *e.g.* the look-and-feel.
3. The emotion prototype.
   (a) The cue, or trigger. The objects, animations, sounds, lighting changes, or other elements of the virtual world that are used to trigger the player's emotional response.
   (b) The action that the player is expected to take. This action is specified relative to the cue.
   (c) The purpose or goal of the player's response. The goal integrates the emotional requirement with the gameplay requirements and design.
4. The emotion timeline. One or more elements of the emotion prototype may be time-dependent [2].

4. Conclusions

Weaknesses in the prior definition of emotional requirements and emotional intensity maps were addressed by the addition of (cue, action, goal) information to the emotional requirements and by the explicit identification of potential locations for the emotion markers (cues).

An enhanced elicitation, capture and specification process for emotional requirements, that better meets the needs of the production team, was developed and tested. Four interaction patterns that may be used to identify new opportunities for enhancing the player experience were also identified.

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