D 5.1

SPECIFICATION OF CINEMATIC IDIOMS

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Abstract

In narrative cinema, the camera is used not only to make the spatial configuration of each scene legible but to expose and develop aspects of the narrative, allowing the film to be read as a whole. In Interactive Storytelling this task is made more complex by dynamic changes occurring within the plot. Texts such as Arijon's *Grammar of the Film Language* describe in detail how to construct shots which adequately describe spatial relationships between characters in a scene, however film-makers also use the camera to establish more complex narrative relations between characters and the worlds they inhabit, using the camera's position, framing, movement and editing.

The cinematic idioms reviewed in this document are specified in terms of canonical camera properties describing the content of the screen, the camera parameters and relations to characters. This level of specification relies on a formalized cinematographic language that enables the transformation of these properties into constraint and optimisation-based systems. The solutions described prioritise spatial and temporal legibility but also cover techniques for exposing subtle relationships between characters, information about the world in which the narrative is set and crucial developments to the plot which cannot be expressed through straightforward action or dialogue.

The "Canteen Scene" from Michael Radford's film 1984 is examined in terms that emphasise the contribution of the cinematography (principally camerawork and editing) to the narrative goals of the scene itself. The scene is analysed shot by shot with reference to the resulting aesthetic or psychological effect of each decision. The scene is also examined in terms of how each narrative event is presented in time and how connections and priorities between events can be configured.

List of Abbreviations

ICT	Information & Communication Technology
IS	Interactive Storytelling
FOV	Field of view
POV	Point of view
LOI	Line of interest

Document History

Version	Date	Comment	Author(s)
1.1	August 30, 2009	Draft version for approval	UNEW: Guy Schofield and Patrick Oliver; INRIA: Marc Christie

1. Cinematography and narrative

In narrative film, each sequence of shots must not only be legible in terms of spatial continuity but must support and expose the greater narrative, allowing the film to be read as a whole. In the case of Interactive Storytelling this is complicated by the possibility of changes occurring within the narrative as it happens, meaning considerations of pace, continuity and the legibility of settings, characters and plots become ever more important.

Existing texts such as Arijon's *Grammar of the Film Language* document cinematographic idioms and allow for the construction of sequences of shots adequately describing spatial relationships between characters in a scene. Arijon also documents how effects such as the prominence of individual characters in the narrative might be emphasised through framing and camera placement. However film-makers also use camerawork and editing to establish more complex narrative relations between characters and the worlds they inhabit.

The specifications discussed in this document assume a certain relationship between action and the camera that differs from the approach of many directors. Specifically, it is assumed that the dialogue and staging is under authorial control and is therefore independent of the camera and editing. The main cinematographic devices we review are specified in terms of canonical camera properties describing the content of the screen, the camera parameters and relations to targets. This level of specification relies on a formalized cinematographic language that enables the transformation of these properties into constraint and optimisation-based systems.

The solutions described here focus mainly on a continuity approach to editing, prioritising spatial and temporal legibility over the aesthetic or psychological effects afforded by alternative approaches such as montage.

In this report we take the "Canteen Scene" from Michael Radford's film 1984, and extract and re-state the principle cinematic idioms in terms that emphasise the contribution of the cinematography (principally camerawork and editing) to the narrative goals of the scene itself.

The presentation is an attempt to restate Arijon's mechanistic presentation of shot collections into idioms (many of which cannot actually be achieved with standard camera set-ups) in terms of the more subtle means by which narrative progression is achieved in Radford's film. For this scene traditionally strong notions of "action" that are the focus of most research in interactive storytelling are mostly incidental. The subtleties of the characters' interactions with each other and the environment are the principal means by which the relational and emotional information in the scene is conveyed and consequently the cinematography (choice of shots and edits) is the director's vehicle for achieving this.

2. Basic cinematographic devices

The techniques specified in this section may be considered a set of components that can be assembled to bring a story to the screen in a way that allows the viewer to easily understand the spatial relations/context of each scene, and the sequence of actions occurring within it. Included are idioms for dealing with camera placement and movement in a variety of settings involving two or three main characters in dialogue – our goal is to characterise these sufficiently to allow us to articulate these in the form of constraints and objectives to be solved by the automated camera control framework. For this purpose, we first propose a description of the canonical cinematographic properties we employ to specify the idioms.

2.1 Identification of canonical properties

In the following section we propose a set of cinematographic properties to precisely specify a shot in terms of composition (layout of elements on the screen), relations between the camera and the targets (distance, high and low angles) and camera motions. This set has been carefully designed to encompass and express most cinematographic properties proposed in the domain (see [5], [6] and [7]).

Regardless of the tasks and the application, the control of a virtual camera relies on the maintenance of properties over the screen, on the camera and on the camera path. Properties are indexed by time expressed either as a fixed value (t) or a range (t0-t1). In the fixed case, the property should hold at the specified time value t. In case of a range of values, the property should hold for all instants between t0 and t1. The symbol '|' in the parameters stands for a disjunctive OR operator, meaning either value can be employed. A number of properties are specified over a target entity (denoted by **ent** in the following table). This entity stands either for an object, a group of objects, a character or a group of characters.

Property	***Description***
`Orientation(ent, view, time)`	constrains the camera to view given entity **ent** from the specified angle **view** (eg. front view). The angle is relative to the intrinsic orientation of the target entity, and **view** is either a single value, or a range of angles, or a range with a preferred value angle. Aliases have been set for common values, such as FRONTVIEW, REARVIEW, LEFTVIEW,TOPVIEW, THREE_QUARTER_FRONT_LEFTVIEW,…
`Size(ent, size, time)`	constrains the projected area of a given entity **ent** on the screen where **size** is percentage of the screen area, or a range of percentages, or a range with a preferred value. The property considers the entity size regardless of it being (partially) occluded by other entities, and considers only the area projected onto the screen (in the case the frame cuts the entity).
`Width(ent, width, time)`	constrains the projected width of a given entity **ent** on the screen where **width** is a percentage of the screen width, or a range of percentages, or a range with a preferred value. The property considers the entity width regardless of it being (partially) occluded by other entities, and considers only the width projected onto the screen (in the case the frame cuts the entity).

Height(ent, height, time)	constrains the projected height of a given entity **ent** where **height** is a percentage of the screen height, or a range of percentages, or a range with a preferred value. The property considers the entity width regardless of it being (partially) occluded by other entities, and considers only the width projected onto the screen (in the case the frame cuts the entity).
Framing (ent, in | out | percentageIn, frame, time)	constrains the projected entity **ent** to be **in**side, **out**side, or for a given percentage **in**side a rectangular frame **frame** defined in screen coordinates (defined between 0 and 1 on both axis, starting at top left corner). The frame can partly lie outside the screen. The property considers the entity position regardless of it being (partially) occluded by other entities. For convenience, two default values for parameter **frame** are provided: RIGHTSCREEN and LEFTSCREEN that respectively represent the whole rightside of the screen (0.5 to 1.0) and the whole leftside (0.0 to 0.5)
RelativeSpatialLocation (ent_1, ent_2, right| left| above| below| infrontof| behind, time)	constrains the projection of entity **ent_1** to appear **right** (or left, or above, ...) the projection of entity **ent_2**. For example, **left** relation is true whenever the leftmost geometric extent of **ent_1** is left of the leftmost geometric extent of **ent_2**, and the rightmost geometric extent of **ent_1** is left of the rightmost geometric extent of **ent_2**.
ScreenSeparation (ent_1, ent_2, sep, time)	constrains the projected entities **ent_1** and **ent_2** to be separated by a distance, or a range of distances, or range plus a preferred value. The distance is measured by the minimum distance between the geometric extents of both entities.
DistanceToCamera(ent, dist, time)	constrains the camera to be placed at distance **dist** from entity **ent**, where **dist** is a value, or a range of values, or a range with a preferred value.
Occlusion(ent, yes | no | percentage, time)	constrains the entity **ent** to be occluded (**yes**) | not occluded (**no**) | occluded for the given percentage of its surface (**percentage**).
InView(ent, yes | no | percentage, time)	constrains the the entity **ent** to be fully projected onto the screen (**yes**), out of the screen (**no**), or for a given percentage of area onto the screen (**percentage**).
FOVAngle(value, time)	constrains the camera to the specified aperture **value**, range of values or range with a preferred value.
Travelling (horizontal|vertical|any, time)	constrains the camera motion to a linear translation movement either **horizontal**, **vertical** or along any axis (**any**).
Panoramic (horizontal|vertical|any, time)	constrains the camera motion to a rotational movement, either around its yaw axis (**horizontal**), its tilt axis (**vertical**), or around any angle (free rotation).
Arcing(horizontal|vertical|any, ent, time)	constrains the camera to an arcing motion (rotation of the camera around the center of entity **ent**). Rotation is either **horizontal**, **vertical** or around **any** axis.
Zoom(In|Out, time)	constrains the camera to a zoom motion (a change in the camera aperture), by either increasing the

	aperture angle (**Out**) or decreasing it (**In**).
`Roll(Left|Right, time)`	Constrains the camera to a **Left** or **Right** rotation around its roll axis.

2.2 Framing

As described by Arijon [1] and Katz [2], particular framings of characters can be used to cover specific situations. Close-ups allow a character's facial expression and eyes to be emphasised whereas medium and full shots allow physical actions or attitudes involving the whole body to be read. To avoid aesthetically awkward compositions, the body is usually cut below the armpits, chest, crotch, waist or knees. In specifying the shots (see Fig. 2), we introduce some terms to identify the parts of the body we need to constrain: **head**, **headtorso** (from head to torso), **headknee** (from head to knee). The term **body** describes the entire character.

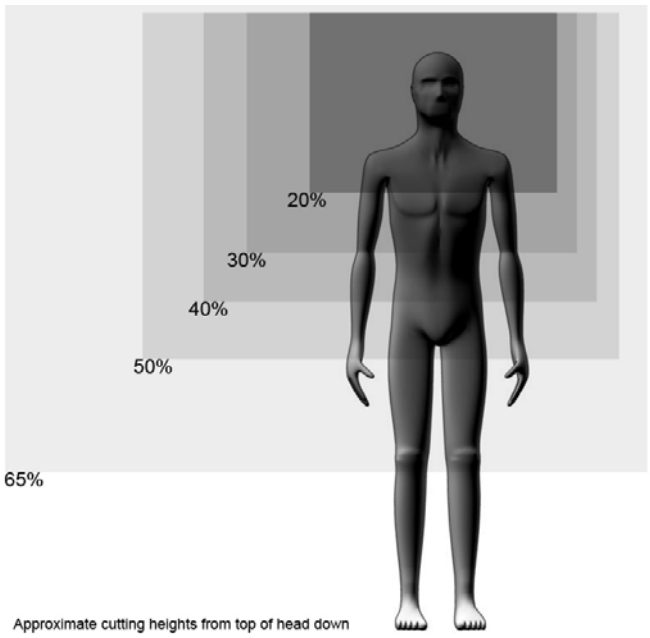
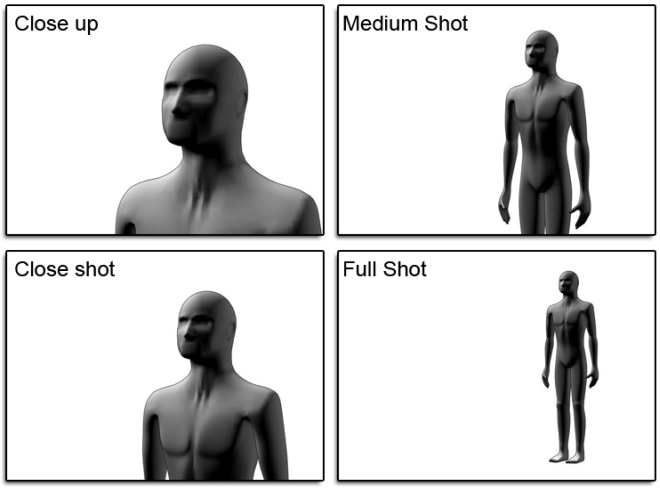


Figure 1 : Conventional cutting heights

Beyond fulfilling requirements such as legibility of physical attitude, facial expression etc. exact frame selection is largely a matter of style, with different directors favouring certain framings. In 1984, Radford uses close-ups for most dialogue shots, cutting to medium or close shots for sequences involving movement. Other intermediate or extreme shots are proposed by the literature (Medium Close Up, Extreme Close Up, Extreme Long Shot).



Close up	**Height(head, [40-60]%, t);** **InView(head, yes, t);** **Occlusion(head, no, t);**
Close Shot	**Height(headtorso,[60-80]%, t);** **InView(headtorso, yes, t);** **Occlusion(headtorso,no,t);**
Medium Shot	**Height(headknee,[80-90]%,t);** **InView(headknee, yes, t);** **Occlusion(headknee,no,t);**
Full Shot	**Height(body, [80-90]%, t);** **InView(body, yes, t);** **Occlusion(body, no, t);**

Figure 2: Conventional framings for human characters

Figure 3: Typical close-up framing in 1984

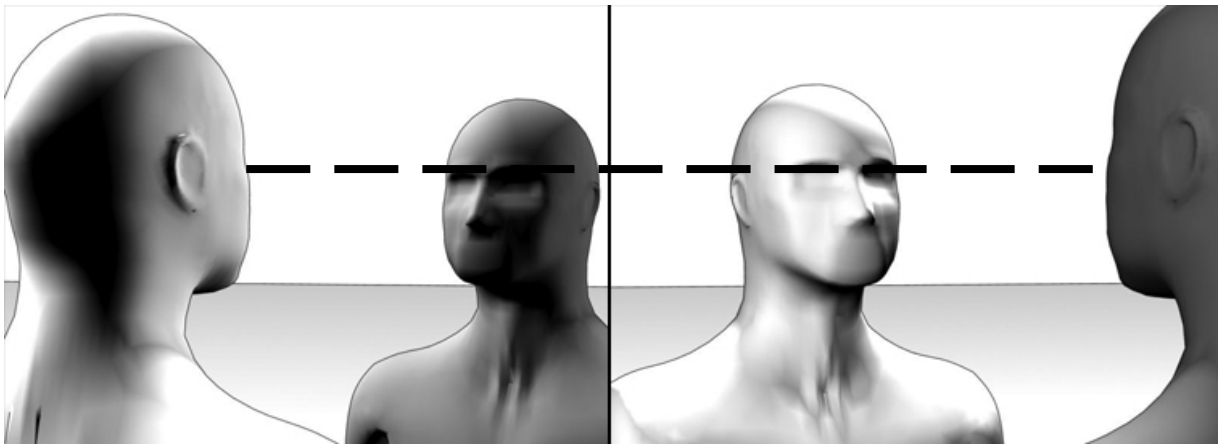
2.3 Composition and balance

Two characters engaged in dialogue with each other are typically represented in paired shots. A character's speech is accompanied by their image, followed by their opposite number's reaction. In considering the composition of possible shots, continuity and continued legibility of the players' relative positions in space is vitally important. Mirroring or the selection of shots of roughly opposite composition is a common device used here. Set-ups where the character occupies an equal proportion of the frame in each shot establishes each character in space without making either seem dominant.

The exact composition of dialogue shots is a often matter of individual directorial style rather than any aesthetic formalism, however as a guideline, in Radford's 1984, each character in the canteen scene

dialogue occupies roughly 40% of the frame.

Figure 4: Smith and Syme occupy opposite portions of the frame mirroring each other.



Left shot	Height(head1, [30-50]%, t);Occlusion(head1, no, t); Height(eye1, [0.3-0.4], t); Orientation(head1, FRONTVIEW, t); Framing(head1, RIGHTSCREEN, t); Occlusion(head2, no, t);Height(eye2, [0.3-0.4], t); Orientation(head2, THREE_QUARTER_RIGHT_REARVIEW, t); InView(head2, [90-100]%, t); RelativeSpatialLocation (head1, head2, right, time);
Right Shot	Height(head2, [30-50]%, t);Occlusion(head2, no, t); Height(eye2, [0.3-0.4], t); Orientation(head2, FRONTVIEW, t); Framing(head2, LEFTSCREEN, t); Occlusion(head1, no, t); Height(eye1, [0.3-0.4], t); Orientation(head1, THREE_QUARTER_LEFT_REARVIEW, t); InView(head2, [30-50]%, t); RelativeSpatialLocation (head1, head2, right, time);

Figure 5: Eyelines consistent across reverse shots. In the specification head1 refers to the dark-shaded character, head2 to the light-shaded one

In a dialogue where two or three characters are at roughly the same elevation, maintaining a consistent eye-level across shots helps maintain spatial legibility. In the canteen scene in 1984, eyelines between characters in dialogue in successive shots are within 10% of each other against the vertical axis of the frame.

2.4 Line of interest

It is considered an almost hard-and-fast rule of cinematography, that the line of interest is inviolate and that shot selection must take place along one side or another but never both. Typically, the line of interest connects the gazes of two characters engaged in dialogue. However, in certain circumstances characters engaged in dialogue may not be looking towards each other. The Line of Interest still joins their heads, regardless of gaze.

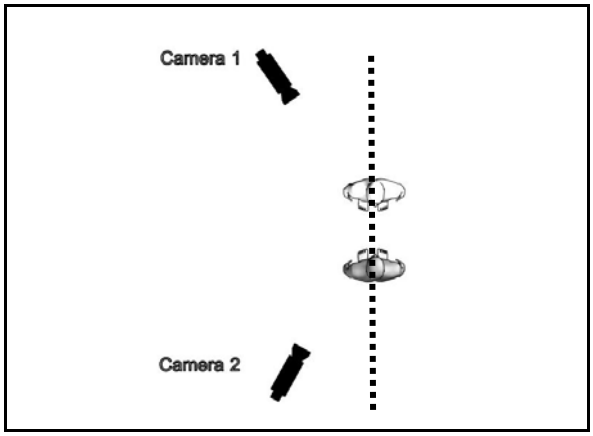


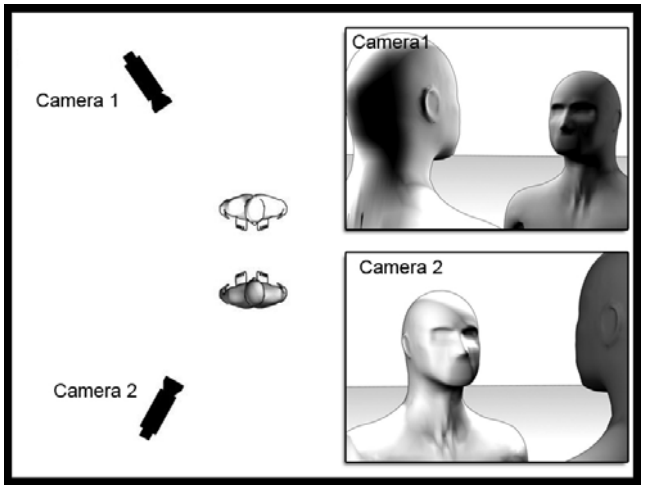
Figure 6: Plan view of a conventional 2 camera setup showing line of interest

2.5 Camera placement for two characters

Commonly used setups for shooting two characters in dialogue are shown below. First and foremost, each shot of a particular idiom reinforces for the viewer the relative positions of the characters.

2.5.1 External reverse shots

The advantage of using external camera positions is that spatial description of the characters takes place in a single shot: the viewer is presented with both characters. However, it is important that in each shot, characters are presented in the same portion of the frame.

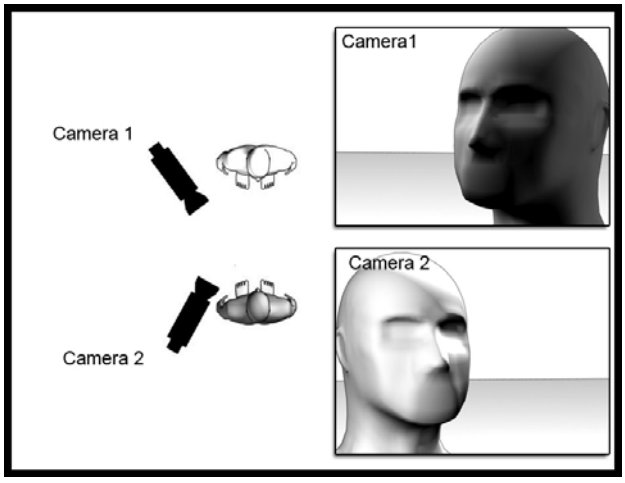


Camera1	Height(head1, [30-50]%, t); Occlusion(head1, no, t); Height(eye1, [0.3-0.4], t); Orientation(head1, FRONTVIEW, t); Framing(head1, RIGHTSCREEN, t); Occlusion(head2, no, t); Height(eye2, [0.3-0.4], t); Orientation(head2, THREE_QUARTER_RIGHT_REARVIEW, t); InView(head2, [90-100]%, t); RelativeSpatialLocation(head1, head2, right, time);
Camera2	Height(head2, [30-50]%, t);Occlusion(head2, no, t); Height(eye2, [0.3-0.4], t); Orientation(head2, FRONTVIEW, t); Framing(head2, LEFTSCREEN, t); Occlusion(head1, no, t); Height(eye1, [0.3-0.4], t); Orientation(head1, THREE_QUATER_LEFT_REARVIEW, t); InView(head1, [30-50]%, t); RelativeSpatialLocation(head1, head2, right, time);

Figure 7: External reverse shots showing framings with their formalization

2.5.2 Internal reverse shots

Internal reverse shots allow characters to occupy a larger proportion of the frame. As the opposite character is not seen, maintaining the eyeline and keeping the camera on one side of the line of interest becomes even more important.

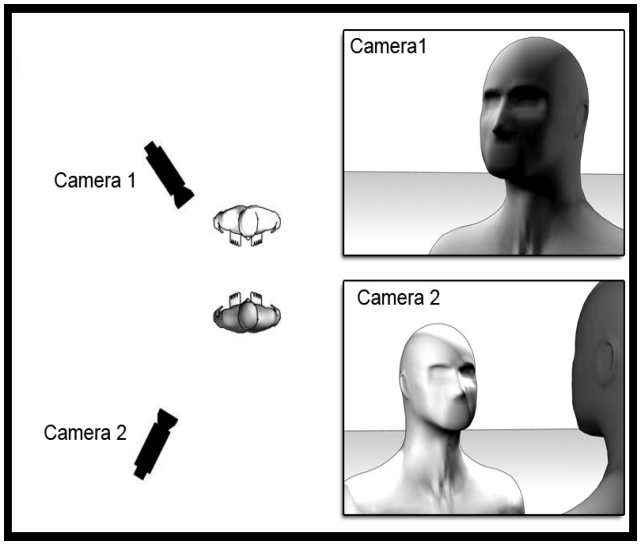


Camera1	Height(head1, [80-90]%, t); Occlusion(head1, no, t); Height(eye1, [0.3-0.4], t); Orientation(head1, THREE_QUATER_FRONT_LEFTVIEW, t); Framing(head1, RIGHTSCREEN, t); InView(head1, [90-100]%, t); InView(head2, no, t);
Camera2	Height(head2, [30-50]%, t); Occlusion(head2, no, t); Height(eye2, [0.3-0.4], t); Orientation(head2, FRONTVIEW, t); Framing(head2, LEFTSCREEN, t); Occlusion(head1, no, t); Height(eye1, [0.3-0.4], t); Orientation(head1, THREE_QUATER_LEFT_REARVIEW, t); InView(head1, [30-50]%, t); RelativeSpatialLocation (head1, head2, right, time);

Figure 8: Internal reverse shots (and formalization)

2.5.3 Mixed external/internal shots

Internal and external reverse shots can be used either consistently or alternately. For example, an external reverse shot can be inserted into a sequence of internal reverse shots to re-state the characters' relative positions.

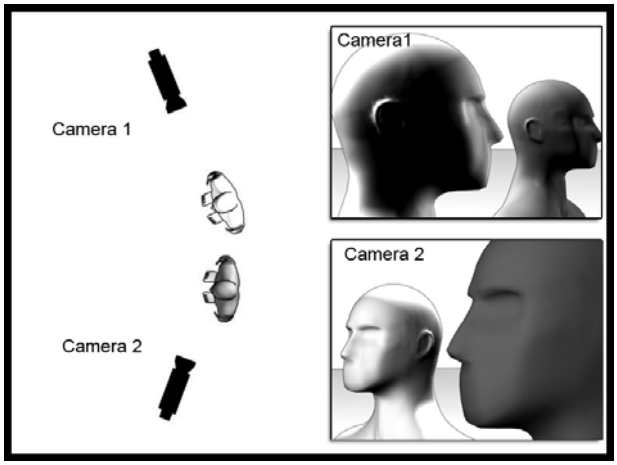


Camera1	**Height(head1, [60-80]%, t);** **Occlusion(head1, no, t);** **Height(eye1, [0.3-0.4], t);** **Orientation(head1,** **THREE_QUARTER_LEFT_FRONTVIEW, t);** **Framing(head1, RIGHTSCREEN, t);** **InView(head2, no, t);**
Camera2	**Height(head2, [80-90]%, t);** **Occlusion(head2, no, t);** **Height(eye2, [0.3-0.4], t);** **Orientation(head2,** **THREE_QUATER_FRONT_RIGHTVIEW, t);** **Framing(head2, LEFTSCREEN, t);** **InView(head2, [90-100]%, t);** **InView(head1, no, t);**

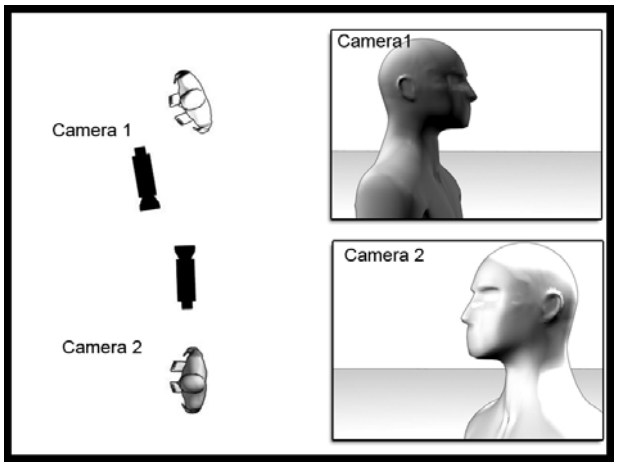
Figure 9: Mixed internal and external reverse shots with their formalization

2.5.4 Variations for different configurations

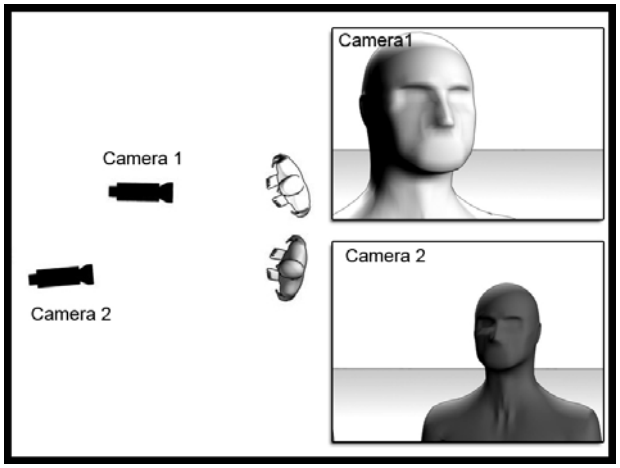
Maintaining the line of interest and characters positions in the frame is vital regardless of the characters exact location and orientation to each other. Side-by-side and L-shaped configurations still require the same methods to maintain continuity.



Camera1	**Height(head1, [40-60]%,** **t);Occlusion(head1, no, t);** **Height(eye1, [0.4-0.5], t);** **Orientation(head1, RIGHTVIEW, t);** **Framing(head1, RIGHTSCREEN, t);** **InView(head1, yes, t);** **Height(head2, [80-90]%, t);** **Occlusion(head2, no, t);** **Height(eye1, [0.4-0.5], t);** **Orientation(head2, RIGHTVIEW, t);** **Framing(head2, LEFTSCREEN, t);** **InView(head2, [90-100]%, t);**
Camera2	Symmetric to Camera1 modulo `InView()`

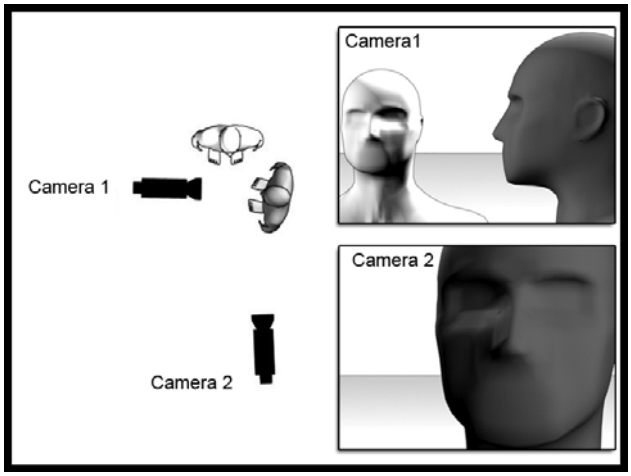


Camera1	**Height(head1, [30-50]%, t);** **Occlusion(head1, no, t);** **Height(eye1, [0.3-0.4], t);** **Orientation(head1, RIGHTVIEW, t);** **Framing(head1, LEFTSCREEN, t);** **InView(head1, yes, t);** **InView(head2, no, t);**
Camera2	Symmetric to Camera1 modulo `InView()`

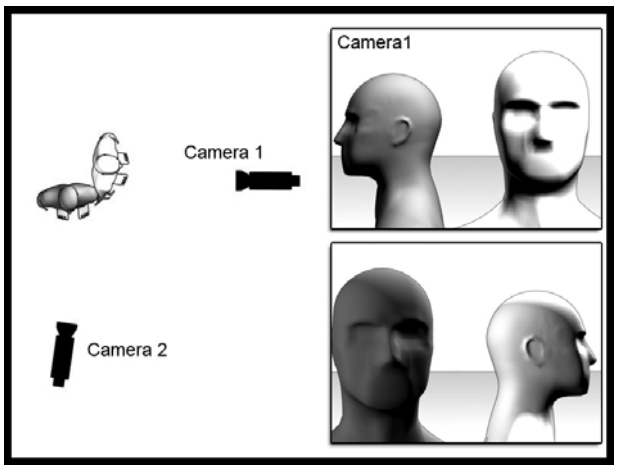


Camera1	**Height(head2, [60-80]%, t);** **Occlusion(head2, no, t);** **Height(eye2, [0.3-0.4], t);** **Orientation(head2, FRONTVIEW, t);** **Framing(head2, LEFTSCREEN, t);** **InView(head2, yes, t);** **InView(head1, no, t);**
Camera2	Symmetric to Camera1 modulo `Height()`

Figure 10: Covering figures side-by-side using external and internal reverse shots

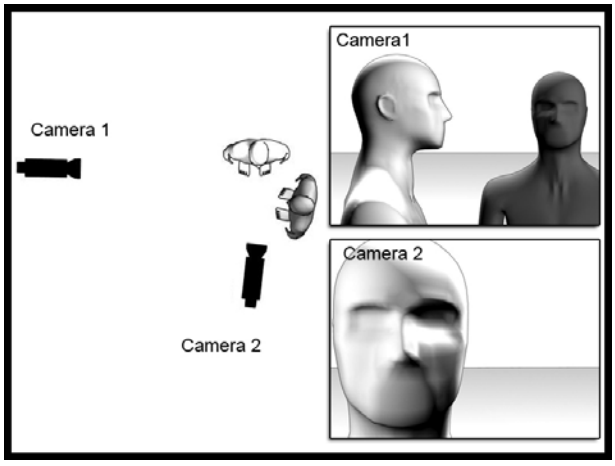


	Height(head1, [40-60]%, t); **Occlusion(head1, no, t);** **Height(eye1, [0.3-0.4], t);** **Orientation(head1, LEFTVIEW, t);** **Framing(head1, LEFTSCREEN, t);** **InView(head1, yes, t);** **Height(head2, [40-60]%, t);** **Occlusion(head2, no, t);** **Height(eye2, [0.3-0.4], t);** **Orientation(head2, FRONTVIEW, t);** **Framing(head2, RIGHTSCREEN, t);** **InView(head2, yes, t);**
Camera2	Symmetric to Camera1…



Camera1	`Height(head1, [40-60]%, t);`
	`Occlusion(head1, no, t);`
	`Height(eye1, [0.3-0.4], t);`
	`Orientation(head1, LEFTVIEW, t);`
	`Framing(head1, LEFTSCREEN, t);`
	`InView(head1, yes, t);`
	
	`Height(head2, [40-60]%, t);`
	`Occlusion(head2, no, t);`
	`Height(eye2, [0.3-0.4], t);`
	`Orientation(head2, FRONTVIEW, t);`
	`Framing(head2, RIGHTSCREEN, t);`
	`InView(head2, yes, t);`

Camera2	Symmetric to Camera1…



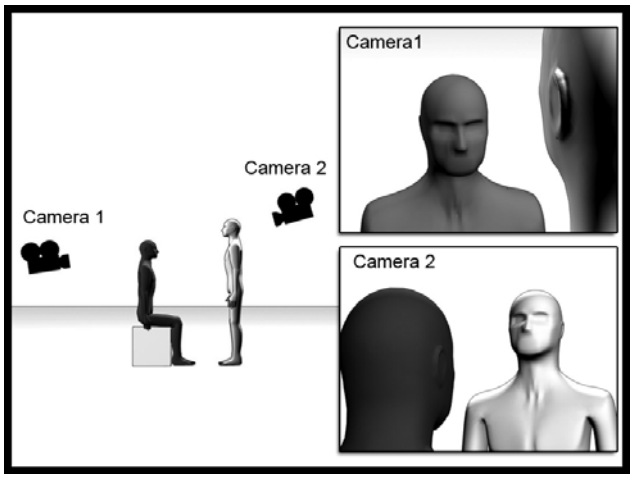
Camera1	`Height(head1, [30-40]%, t);`
	`Occlusion(head1, no, t);`
	`Height(eye1, [0.3-0.4], t);`
	`Orientation(head1, FRONTVIEW, t);`
	`Framing(head2, RIGHTSCREEN, t);`
	`InView(head1, yes, t);`
	
	`Height(head2, [30-40]%, t);`
	`Occlusion(head2, no, t);`
	`Height(eye2, [0.3-0.4], t);`
	`Orientation(head2, LEFTVIEW, t);`
	`Framing(head2, LEFTSCREEN, t);`
	`InView(head2, yes, t);`

Camera2	See top picture (Camera2)

Figure 11: Covering L-shaped configurations

2.5.5 Variations in height

Characters who vary in height can still be covered by the same sets of paired shots, although the camera must be tilted to compensate for the difference in eyelines.

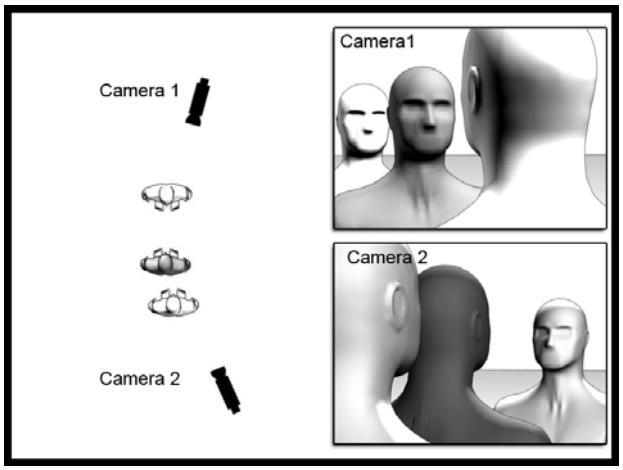


Camera1	**Height(head1, [40-60]%, t);** **Occlusion(head1, no, t);** **Height(eye1, [0.45-0.55], t);** **Orientation(head1, FRONTVIEW, t);** **Framing(head1, LEFTSCREEN, t);** **InView(head1, yes, t);** **Height(head2, [80-90]%, t);** **Occlusion(head2, no, t);** **Height(eye2, [0.2-0.3], t);** **Orientation(head2, REARVIEW, t);** **Framing(head2, RIGHTSCREEN, t);** **InView(head2, [20-30]%, t);**
Camera2	**Height(head1, [60-80]%, t);** **Occlusion(head1, no, t);** **Height(eye1, [0.45-0.55], t);** **Orientation(head1, REARVIEW, t);** **Framing(head1, LEFTSCREEN, t);** **InView(head1, yes, t);** **Height(head2, [20-30]%, t);** **Occlusion(head2, no, t);** **Height(eye2, [0.2-0.3], t);** **Orientation(head2, FRONTVIEW, t);** **Framing(head2, RIGHTSCREEN, t);** **InView(head2, yes, t);**

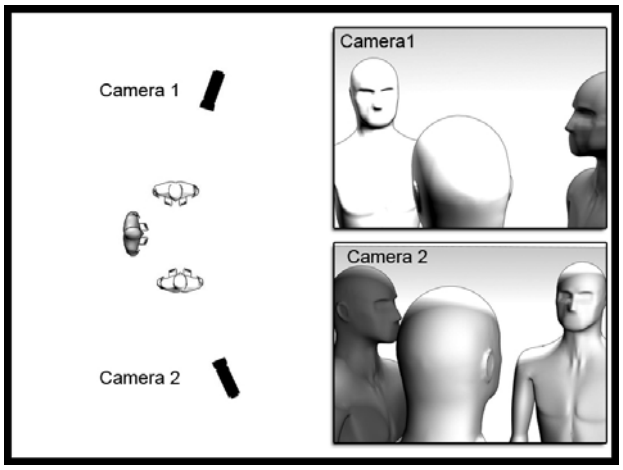
Figure 12: Covering characters whose heads are at different heights

2.6 Camera placement for three characters

Shooting more than two characters naturally requires greater attention to establishing the space in which the dialogue occurs. Below are idioms allowing coverage of conversation between 3 characters.



Camera1	**Height(head1, [40-50]%, t);** **Occlusion(head1, no, t);** **Orientation(head1, FRONTVIEW, t);** **Framing(head1, LEFTSCREEN, t);** **InView(head1, yes, t);** **Height(head2, [40-60]%, t);** **Occlusion(head2, no, t);** **Orientation(head2, FRONTVIEW, t);** **Framing(head2, LEFTSCREEN, t);** **InView(head2, yes, t);** **Height(head3, [60-80]%, t);** **Occlusion(head3, no, t);** **Orientation(head3, REARVIEW, t);** **Framing(head3, RIGHTSCREEN, t);** **InView(head3, [80-100]%, t);**
Camera2	Symmetric to Camera1



Camera1	**Height(head1, [30-40]%, t);** **Occlusion(head1, no, t);** **Orientation(head1, FRONTVIEW, t);** **Framing(head1, LEFTSCREEN, t);** **InView(head1, yes, t);** **Height(head2, [40-60]%, t);** **Occlusion(head2, no, t);** **Orientation(head2, REARVIEW, t);** **Framing(head2, CENTERSCREEN, t);** **InView(head2, [80-100]%, t);** **Height(head3, [30-40]%, t);** **Occlusion(head3, no, t);** **Orientation(head3, RIGHTVIEW, t);** **Framing(head3, RIGHTSCREEN, t);** **InView(head3, [40-100]%, t);**
Camera2	Symmetric to Camera1

Figure 13: Possible Camera positions for covering a three-way dialogue.

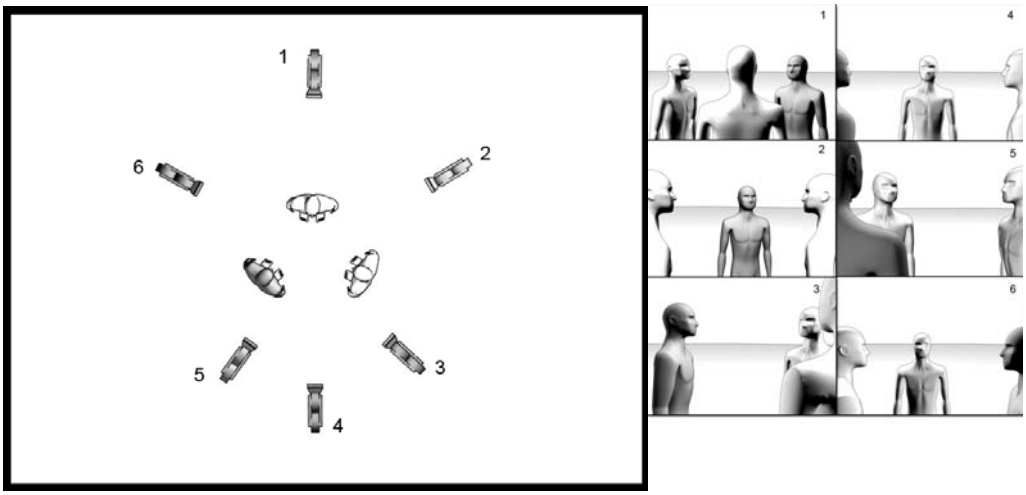


Figure 14: Camera positions for characters in a triangular configuration.

2.7 Character movement

Shooting characters moving from place to place involves careful planning if the viewer is to maintain his/her understanding of the spatial makeup of the scene. Covering a change of orientation in a character by cutting to a closer camera reinforces the character's new direction. Actions covered in more than one shot must follow a consistent direction across the frame.

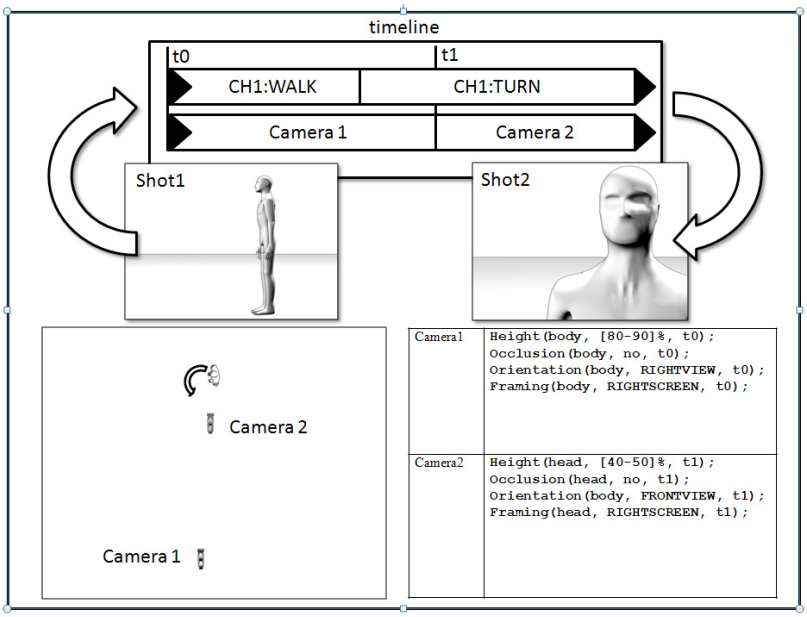


Figure 15: Covering a turning character by advancing the camera

Here, a character changes orientation during a dialogue. External Reverse angles maintain the character's position in the frame.

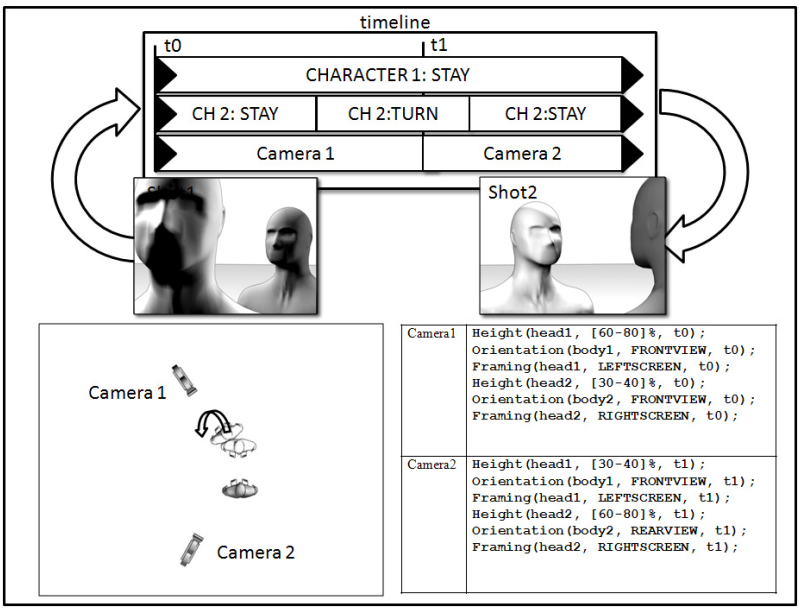


Figure 16: Covering a character through a 180degree turn

Characters may change direction to face away or towards the camera. The Line of interest however is still considered to be between them. Here the situation is covered by cutting from external to internal reverse shots.

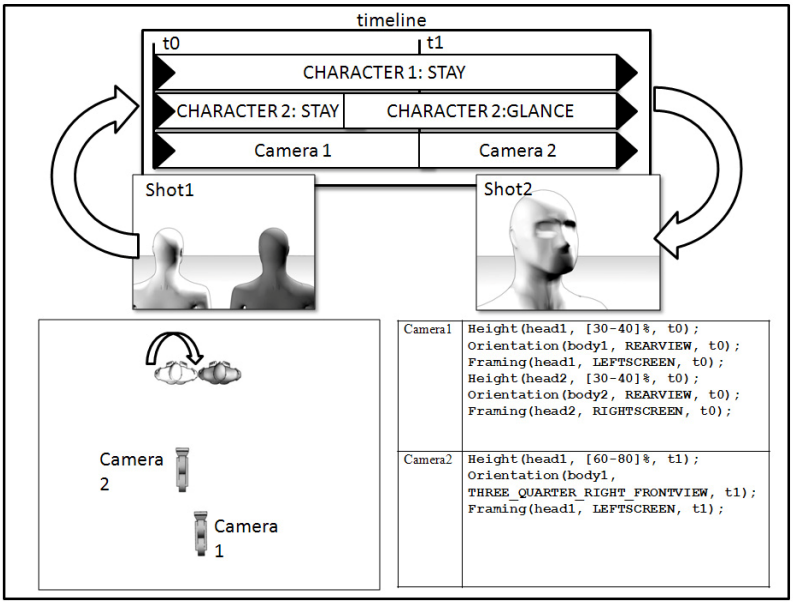


Figure 17: Covering a character glancing backwards

Character actions such as rising or sitting often change the composition of a scene dramatically. Cutting to a wider or tighter shot is an effective way of adjusting for the

character's new position in the frame. As previously stated, the cut should occur 1/3 of the way through the character's motion.

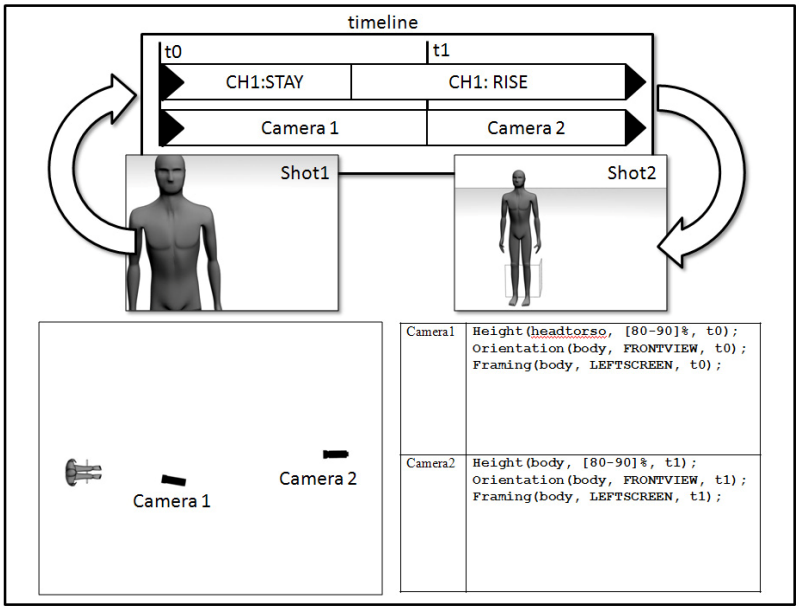


Figure 18: Covering a character rising from a sitting position

Covering a character crossing a large space should be treated in the same way, with the action divided 1/3 vs 2/3.

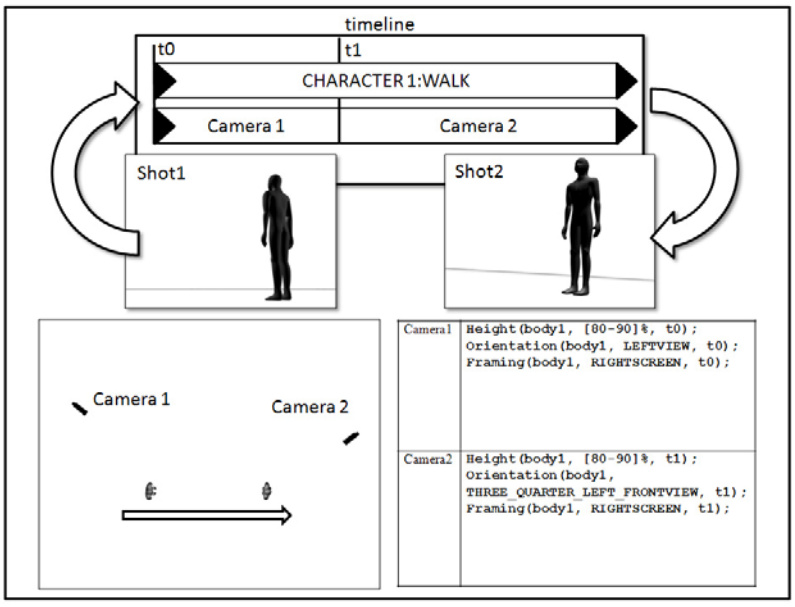


Figure 19: Framing a character crossing a space

2.8 Camera movement

Camera movement in linear cinema is usually used only for special purposes. Panning from one subject to another rather than cutting invariably producing frames of incidental footage between subjects which might be distracting to the viewer. In the canteen scene in 1984, the camera constantly makes small panning and tilting movements, adding to the uncomfortable tension in the scene. However, these movements are small enough not to change the framing of the scene. Panning shots may be used to simulate a subjective view. For example when preceded by a reaction shot on a character, the viewer reads the panning shot as the character surveying the scene.

2.9 Editing

Multiple camera idioms are used in cinematography because of their ability to arrange the narrative in space in a way that can be easily read by the viewer. Cutting between cameras is also a highly formalised process. In line with traditional Continuity Editing techniques as described by Bordwell and Thompson [4], shot selection in dialogue scenes is usually formed around the script and is temporally continuous. During each utterance the speaker is pictured, and cuts occur when another character reacts in some way to the utterance or replies with another. More complex editing techniques involving montage, temporal ellipsis and others are discussed in section 3. If other actions occur within the scene, it may be necessary to cut from one camera to another to follow the action. A rule-of-thumb used in this situation is to include on third of the action at the end of the first shot and two thirds in the beginning of the second..

3. Advanced narrative devices

The idioms and constraints discussed so far serve only to make the actions in Interactive Stories legible in terms of space and continuity; however, these concerns form only part of the techniques needed to properly elucidate the goals of any narrative. Camerawork and editing not only serve to document the action but may also be called upon to expose narrative information not visible from every possible viewpoint.

In the case of Michael Radford's 1984, relying only on these basic rules to shoot the dialogue within the film would leave the viewer entirely unaware of the characters' motivations and consequent effects on the development of the story. In the canteen scene in particular, the dialogue has little bearing on the narrative: the conversation mostly revolves around day-to-day and seemingly mundane themes such as food and work. In terms of imparting information, more is achieved by Radford's employment of cinematographic devices to expose and amplify subtle actions that would otherwise pass unnoticed.

In linear cinema, narrative information is imparted to the viewer over the course of the film in line with temporal conventions with which the viewer is already familiar. In IS, this might not always be the case. However, by considering each scene as a unit, with its own narrative goals within the greater structure of the story, visual information to be shot can be usefully divided into two types:

3.1 Information pertaining to the characters and plot development.

Clearly, many actions such as dialogue make sense and contribute to the story only when presented in a particular sequence. Actions such as the introduction of important characters or particular objects, actions of speech which are crucial to the development of the plot or the viewer's understanding of the narrative depend on being presented at particular junctures within the story. In 1984, Smith enters the main space of the canteen and notices Julia is watching him. The timing of this encounter early on in the scene is crucial as through this single pair of shots the viewer is:

1. *introduced* to Julia and prepared for her participation in later scenes;
2. *reminded* that surveillance and watching one's peers is a central theme of the narrative;
3. *alerted* to the fact that Smith is more interested in the people around him than his friend Syme which affects the viewers understanding of all subsequent dialogue.

This information is imparted through framing and editing rather than by any single action on the part of either character. Both characters are almost motionless during the sequence.

Figure 20: Cutaway POV from Smith to Julia.

3.2 Information about the world

Other equally important information serves to support and enrich the narrative as a whole rather than form integral parts of its structure and in the case of 1984, often depends little on the sequence in which it is presented. This information could be considered a series of discrete facts that are drip-fed into the action over the course of the film. This supporting narrative information can be exposed through the actions of characters other than the main protagonists or through the inclusion of particular objects and spaces.

An example of this in 1984 is the establishing shot in which an anonymous extra watches the telescreen for several seconds. The viewer learns from this that the omnipresent telescreen are significant to the society in which the film is set.

Figure 21: Establishing Shot with extra

Another piece of peripheral narrative information concerns the food served in the canteen

which is presented in 3 shots. In the first, the food is slopped into bowls, in the second Smith hesitates for several seconds before putting it in his mouth, in the third Parsons expresses pleasure despite stating that there is no meat in the stew. From this the viewer is reminded that conditions in Oceania are poor for the characters and party members are expected to be enthusiastic nevertheless.

Figure 22: Following the food theme: significant objects are often shown 3 times

3.3 Composition and proportion

Composition, apart from establishing space, can also be used to state the relationships between characters. Used simply, framing a character so that he/she appears tiny in relation to the whole frame can emphasise his or her vulnerability or insignificance. In dialogue shots, a character framed to appear larger will seem dominant and through the consequent enlargement of their features, facial expressions can be emphasised. By gradually increasing the amount of screen-space a character inhabits in subsequent shots by either narrowing the field of view or moving the camera towards them, the viewer's attention can be drawn especially to the character.

In shots 12, 14, 16, the camera tightens slowly on Syme during his speech about the Newspeak Dictionary, increasing the amount of screen space he inhabits. This has the effect of making him appear more enthused about his subject and gives his utterances more importance. However, as he still occupies slightly less screen space than Smith, the viewer still identifies Smith as the central character in the narrative.

Figure 23: Tightening slowly on Syme

3.4 Depth of field

A shallow depth of field can be used to ascribe prominence to characters and objects, especially within visually busy or cluttered shots. This technique can counter the distracting effects of objects or characters moving between the camera and subject.

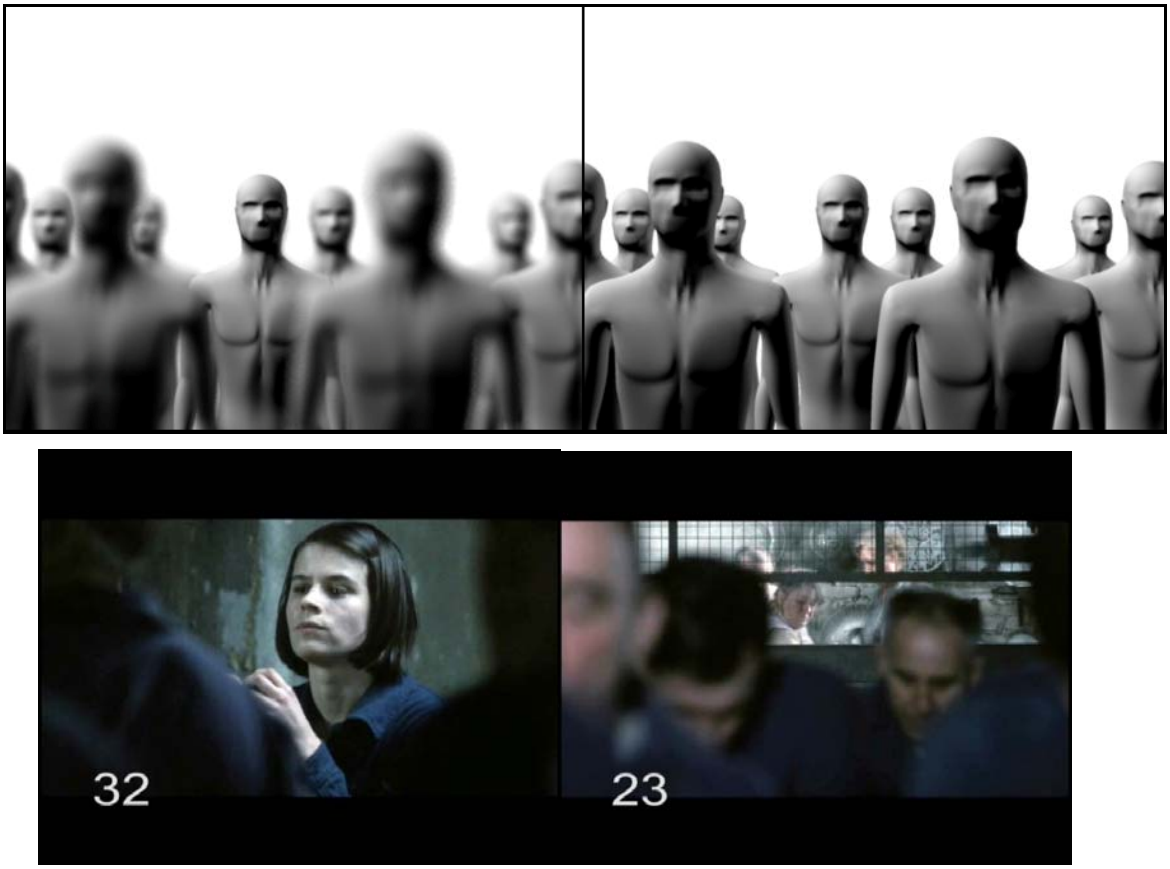


Figure 24: A zoom lens with its characteristic shallow depth of field distinguishes subjects from their background

Equally a deep field can highlight a character's association with others in the scene or emphasise dramatic actions, such as a character attempting to hide within a crowd.

3.5 Occlusion and isolation

By pairing a shot in which one character is alone with a shot in which multiple characters are present, even in the background, a sense of the first character's isolation can be emphasised.

Figure 25: Contrasting Smith's isolation with Syme's companions in the party

Obscuring the face of a character, whether through framing or through use of an occluding object, can communicate to the viewer that they are secondary to the plot. This is used in 1984 to characterise the Proles as a faceless mass and not to be considered as individual characters. To counterbalance the distracting effect of characters or objects in the foreground, a shallow depth of field must be used (see previous section).

Figure 26: Obscuring the faces of the proles

3.6 Objects

Composition can be used to introduce or revisit narrative threads. Including significant objects within the composition of a shot can keep particular themes in mind, even if they are only seen peripherally. Throughout the canteen scene in 1984 the presence of the telescreen over Smith’s shoulder reinforces the idea that Smith is being watched and increases the impression of tension within the scene.

Figure 27: The Telescreen clearly visible over Smith's shoulder

3.7 Direction of gaze

The line of interest is of paramount importance to conventional linear film making. This compositional line linking the heads of characters in dialogue is crucial because as human beings the eye is our most important directional indicator.

Characters in dialogue generally look off camera, as looking directly out of the frame tends to place the viewer in the action. The exception to this is during a POV shot, where the direct gaze of characters allow the viewer to understand that their own gaze has become contingent with that of a character.

Conventions such as following a character's gaze with a POV shot capitalise on this. In figure 28 Smith's attention is clearly caught and the camera cuts to follow his gaze. As Julia is staring directly at the camera, the viewer understands that we in this shot we are looking through Smith's eyes.

Figure 28: A cutaway to Julia following Smith's gaze. N.B Julia is looking directly into the camera, placing the viewer in a subjective position

Through the act of looking at an object or other person, a character automatically ascribes significance to it. Conversely, by following a character looking away from a dialogue, for instance to a part of the frame where the viewer knows no character is located, the camera can indicate lack of interest on the part of a character.

4. Linking narrative, editing and shot selection

4.1 Further editing issues

In Continuity Editing, dialogue is edited using match-on-action pairs of shots, where a character is pictured speaking and his/her opposite number is seen reacting in a shot that is roughly a mirror image of the first. Figure 29 shows the length of each shot compared to each utterance in the canteen scene in 1984. Overlaps where cuts occur demonstrate the pattern of shot and reaction-shot used to cover both the speaker and respondent.

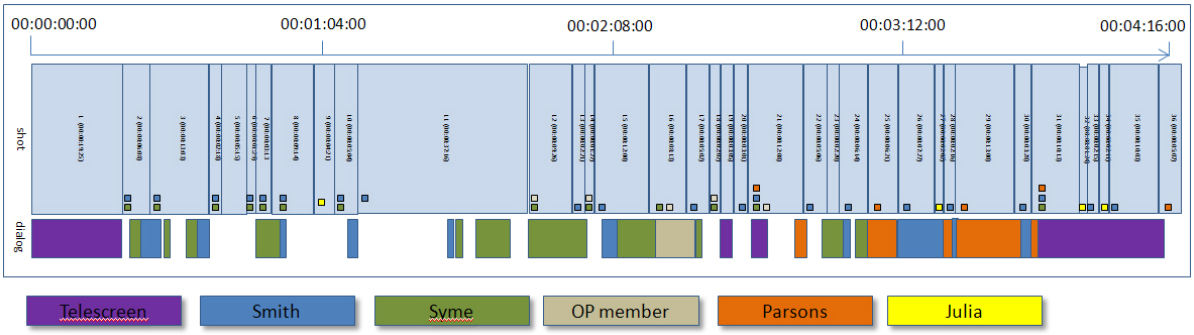


Figure 29: Shots in the Canteen sequence scaled by time. Colour bars indicate speaking character. Colour squares indicate character onscreen

This pattern can adequately convey the sense of a conversation with the viewer following much as he/she would in real life but can also be subverted in order to achieve specific effects. By failing to cut to a character speaking and instead remaining on another character, the attention of the viewer can be diverted away from a dialogue. This can be used to indicate disinterest on the part of the character pictured or their sudden interest in something else within the scene. This is clearly visible in the diagram above, where, in Shots 11 and 15, the camera remains on Smith even though Syme is speaking. This is often accompanied by a drop in the volume of the dialogue and can be followed by a cutaway to the new source of interest.

4.1.1 Ellipsis

Several easily legible techniques can be used to distinguish between actions occurring along 'in real time' and actions which are to be read as temporally discontinuous. Use of transition effects such as dissolves or fades as opposed to straight cuts are usually read as signalling either ellipsis or the introduction of a new temporal or spatial context.

4.1.2 Pace and meter

By varying the pace at which shots are selected, various changes in pace can be achieved. Simple measures such as increasing the average speed of cutting can enhance the sense of tension, speed or chaotic action within a scene. Choosing a moving camera over a stationary one also has this effect: a slightly moving frame often being read through its association with the documentary as placing the viewer more completely in the action.

These effects can be highly effective when contrasted against their opposites. In 1984, the camera constantly shifts slightly, enhancing the viewer's impression of the characters'

unease. However when the telescreen speaks, the camera halts completely, reflecting the stillness and tension of the characters. When Smith sits and gathers his thoughts at the table in the canteen scene, the camera lingers on him for 34 seconds, emphasising his isolation and unease.

Figure 30: Shot 11 as Smith gathers his thoughts, lasts significantly longer than any other in the sequence.

Equally, choosing a fast-moving camera in a succession of quick cuts may be used in contrast to previous and following scenes, having a direct effect on the overall structure of a narrative.

4.1.3 Establishing shots

Establishing shots are often used at the beginning of a scene to introduce characters, spaces or objects to the viewer. They often function as an overview of the space in which the action takes place, locating the characters and their spatial relationship to each other. Movements such as slow tracking or panning of the camera are often used to encompass as much of the scene in detail as possible.

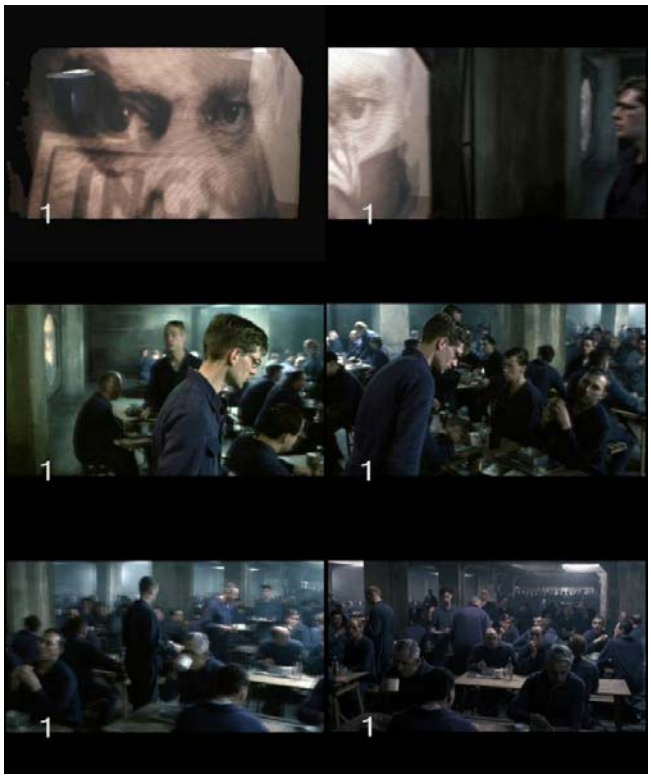


Figure 31: Establishing shot panning around the room

Once again, in addition to functions of spatial description, establishing shots perform a vital narrative role through being an opportunity for the viewer to establish the visual components of the scene before dialogue occurs.

In introducing particularly complex or unfamiliar scenes, sequences of establishing shots can be used. These need not be part of a cohesive idiom of spatially related shots as the viewer does not necessarily need to know the exact layout of all parts of the scene.

4.1.4 POV shots and the subjective camera

Generally, cameras move only to track the action in a scene. An exception to this rule is the POV shot, which has several unique properties. By moving the camera forward at eye level (especially if some secondary movement such as camera-shake is discernible) the shot can be read as looking out through the eyes of a character.

4.1.5 Montage

Montage techniques can be usefully employed to impart narrative information to the viewer in contexts where the psychological or intellectual content of the narrative is more important than the spatial legibility of the sequence. The juxtaposition in subsequent shots of 2 sequences can be used to emphasise meaning or affect.

4.2 Cinematography and narrative

Within a film, narrative information is imparted to the viewer over time. This information may be presented as audio information (through the dialogue, soundtrack or diagetic sound) or

through displaying actions. Clearly, actions that are not included in the dialogue must be presented entirely through cinematography and call for careful shot selection. With respect to IS, certain factors may be altered, as a result of which the direction of the scene must be recomputed in order to preserve its meaning. These factors are primarily the scene length, the number of cuts, the spatial configuration of characters and the actions of characters including dialogue.

The cinematic style of the film seeks to support the narrative, and this can be viewed as a particular parameterisation of idioms described in the previous section which are applied before composing individual shots in order to attempt to retain the outcomes of the scene. The following rules are specific to the direction of 1984 and attempt to retain the directorial style of the original.

- Main character must appear in 70% of shots.
- Narrative information must be included in required proportions (see above).
- Shots during dialogue must follow the speaker and then cut to reaction.
- Dialogue must be covered using internal reverse shots where possible.
- If an action occurs involving a character's gaze, a POV shot should cover it.
- Character movement should be covered using one of the techniques below.
- Beginnings and endings of sequences should be covered using a fade.
- Camera should be static: changes of view should be covered by a cut.
- Shots less than 30 degrees apart should be consolidated.
- Shots should be between 1 and 10 seconds.

By considering each scene to have start and end states, a body of narrative information can be established which allows multiple routes through the scene (in terms of both staging and cinematography). The development or introduction of characters and themes may be considered as properties for judging the success of a particular edit, in the same way that certain compositional properties may be applied to individual shots.

In the context of IS, it is useful to categorize these actions scene by scene in order to best present them. For instance, certain actions may represent themes developed earlier in the story while others (such as the introduction of new characters) may represent entirely new narrative threads. There may also be a need for the subtle presentation of actions, objects or characters that may play a greater part in the narrative later on.

Looking at the Canteen scene in 1984, it is possible to break down the huge number of actions (including cinematographic events such as placing a character or object onscreen) into a number of facts. Some of these facts are presented in a single shot and indeed in the case of minor details (such as the prevalence of Victory Gin advertisements in 1984) may not even be the subject of the shot.

Figure 32. Gin is dispensed from a hatch

Figure 33. Julia is watching Smith

More important factors, such as Smith's unease around Syme may be presented a number of times in multiple shots and both through dialogue and cinematography. For example in separate actions, Smith lies to Syme about razor blades, Smith is uncomfortable around Syme on multiple occasions as Syme evangelises about the regime. From previous scenes, the viewer knows that Smith is isolated and silently opposes the regime: therefore Syme's support of the regime contributes to the developing sense that Smith fears and dislikes Syme. For the Michael Radford's "Canteen Scene" is 1984 we can enumerate what narrative information is introduced, emphasised and whether this is achieved conveyed through the cinematography, the dialogue or both (see table 1).

Narrative information	*New*	*Number of shots*	*Cinematography*	*Dialogue*
Telescreens are everywhere	NO	14	YES	NO
People stop to watch telescreens	YES	1	YES	NO
Canteen is where Syme and Smith eat	YES	35	YES	NO
Syme and Smith are friends	YES	17	YES	YES
Proles serve the OP	NO	7	YES	NO
Smith lies to his comrades	NO	1	NO	YES
Hangings are entertainment	NO	2	NO	YES
OP drink gin	NO	9	YES	YES
Victory gin is the only brand	NO	2	YES	NO
Smith is cautious around Syme	YES	17	YES	YES
Gin is dispensed from a hatch	YES	2	YES	YES
Julia is watching Smith	YES	3	YES	NO
Smith is aware of Julia	YES	5	YES	NO
Syme works on the dictionary	YES	5	NO	YES
The language is shrinking	YES	1	NO	YES
Newspeak involves cleaning the language	YES	2	NO	YES
Syme evangelises about the regime.	YES	5	NO	YES
The meat in the canteen is awful	YES	4	YES	
OP members talk freely to each other about matters of doctrine	NO	2	NO	YES
OP members spontaneously make ovations	NO	2	YES	NO
The telescreens rewrite the facts	YES	1	NO	YES
OP members believe the telescreens	YES	1	YES	NO
Parsons is unquestioningly enthusiastic	NO	5	YES	YES

Table 1. Narrative information and the role of cinematography for the "Canteen Scene"

In order to construct an edit that has the same start and end states as the original film, all these facts need to be presented to the viewer over the course of the scene.

To incorporate this information in the editing process it is useful to consider the proportion of the scene through which the information is presented, so for instance, a simple fact such as

‘Smith and Syme are eating in the canteen’ needs to be restated in the vast majority of shots in order to maintain the sequence’s sense of place. The omnipresent telescreen also need to be included in a large number of shots, regardless of the length of the sequence. By changing these proportions the meaning of the narrative may be modified. For example, if Smith’s nervous reactions to Syme’s statements were omitted in favour of the camera staying on Syme, their relationship might appear quite different.

From these considerations it is now possible to apply certain properties to the construction of multiple edits of the same scene, regardless of its length or spatial configuration. If the dialogue between Syme and Smith took place in a different location (for instance, they remained in the queue) it may still be possible to create a scene with the same meaning). So long as the proportions of information remain the same (for instance around 13% of all shots include dialogue or coverage of actions which reinforce the idea that Parsons is unquestioningly supportive of the regime) the meaning of the scene should remain intact.

This approach also allows for the modification of the outcome of a scene. If these proportions are changed, the contribution of the scene to the overall narrative progression may change. If Smith’s looking at Julia is only presented once, the viewer may well consider it to be of far less importance to the plot than in the original edit.

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