

① Offer a means to existing story fragments, ~~both sequentially, descriptively and interactively~~ *compose and thereby reuse*

Overall structure of chapter need review.
Explanation needs to be of the form
This is the problem / what are the
options / choose this because rather
than "This is the solution because".

Chapter 1 4 5

Tropes as Story Components

This chapter describes the foundations of our new formalism for narrative: story tropes. Though our use of tropes for the description of stories has many advantages, the main advantage that we will focus on throughout this thesis is that they provide a means of creating new abstractions from existing tropes. For more detail on how tropes allow us to do this, please see section ??

Though story tropes may be a familiar concept to many outside of the academic community, they do not appear in the literature in either fields Computer Science or Narratology at the time of writing. Therefore this chapter contains a thorough description of what a story trope is, along with several examples.

As previously described in chapter ??, tropes are patterns that appear throughout various different media. Once one is familiar with a trope, it becomes easy to identify its use in any story. Take, for example, the *Hero's Journey* trope first described in chapter ???. It is a template which is repeated so often in many different media, stories and contexts that it is instantly recognised even by those that are completely unfamiliar with the concept of tropes.

In this section we examine the concept of a "trope", deconstructing examples to demonstrate widely-recognised trope patterns, and exploring tropes that operate at different levels of abstraction within a story. At the end of the section we *identify a formal definition of a trope, and how it fits within the wider context of a story.*

1.1 Tropes: a "Folksonomy" of Story Components

The existence of a website called "TV Tropes" (TV Tropes, 2017a) makes the discovery of example tropes very simple. TV Tropes is a wiki for tropes, containing over 27,000 trope descriptions, along with the media that they appear in. For example, the "The Empire" trope appears in *Star Wars*, Asimov's *Foundation* trilogy, the *Hunger Games* books and films, and the *Final Fantasy* series of games, and a great many more stories in media.

Figure 1-1 shows a screenshot of the "The Empire" page on the website. It clearly shows the description of the trope at the top of the page, and there are also instances of its use across different media at the bottom.

Edit Page | Related | Discussion | History | More ▾ | Watch

The Empire

Share ↗

Main | Laconic | Quotes | PlayingWith | Create New ▾

"If the enemy be rich, they are rapacious; if he be poor, they lust for dominion; neither the east nor the west has been able to satisfy them. Alone among men they covet with equal eagerness poverty and riches. To robbery, slaughter, plunder, they give the lying name of empire; they make a desert and call it peace."

— **Calgacus**, Caledonian warlord on the Roman Empire^{note}

The Evil Counterpart to The Republic. The Foil to The Kingdom. The Shadow Archetype (or evil twin sister) to Hegemonic Empire. The Rival to The Federation. The Logical Extreme of the Rising Empire.

The Empire's defining Grand Ambition is World (Or Interstellar/Galactic/Universal) Domination. Amassing The Evil Army, it sets out to conquer all of its neighbours and be the sole superpower by force of arms. Taking cues from history, it often resembles the historic Roman, German, British, Russian/Soviet, or Chinese empires in some way. Led by The Emperor, who is usually also an Evil Overlord, Emperor Scientist or God-Emperor or by some kind of theocratic cabal. A theocracy of a Religion of Evil will almost certainly be the Empire.

If the Empire is not Obviously Evil, it may represent itself as the Lightbearer of Civilization, Defender of Faith, Domain of Law and Order, The Co-Prosperity Sphere, Central State of Humankind or Legitimate Regent of Humanity. People's Republic of Tyranny may overlap with these titles. The Empire may be genuinely highly civilized, wealthy, organized, and/or vital, or corrupt, bureaucratic, sybarite and/or ossified. It may be militaristic and imperialistic, or pacifistic and turned inwards. In nearly all instances, the Empire features an original founding polity, usually a race or nationality, who stand above and enjoy special privileges that are denied to the Empire's various subject peoples.



Terra Prime.
Forever.

Figure 1-1: A screenshot of the “The Empire” wiki page from TV Tropes

Tropes can also describe character archetypes. For example, this is how TV Tropes describes *Anti-Hero* characters:

An Archetypal Character who is almost as common in modern fiction as the Ideal Hero, an antihero is a protagonist who has the opposite of most of the traditional attributes of a hero. They may be bewildered, ineffectual, deluded, or merely apathetic. More often an antihero is just an amoral misfit. While heroes are typically conventional, anti-heroes, depending on the circumstances, may be pre-conventional (in a "good" society), postconventional (if the government is "evil") or even unconventional. Not to be confused with the Villain or the Big Bad, who is the opponent of Heroes (and Anti-Heroes, for that matter).

TV Tropes further clarifies that there are ~~even~~ further subdivisions of Anti-Hero, depending on just how evil or cynical the character is. Batman, for example, would be a highly cynical Anti-Hero who is nevertheless morally good.

Shakespeare's Macbeth is a character who becomes more and more of an evil Anti-Hero, until he is too morally evil to still be a Hero and instead becomes a Tragic Villain.

Tropes can be very specific, referring to individual lines of dialogue. One example is “We Will Meet Again”:

The standard phrase when the villain finds that he has been defeated by the heroes and there is no point in staying around with the immediate Evil Plan foiled.

Tropes can also be very abstract, referring to particular genres, types of story, or events in a story that move the action forward. Other than the previously mentioned “Hero’s Journey” and “The Empire” tropes, another example could be the “Hilarity Ensues” trope:

Actions that are dangerous or illegal often lead to injury, arrest, job dismissal, expulsion from school, deportation, or other dire consequences. Thankfully for our fictional friends, both the Rule of Cool and the Rule of Funny keep them safe (the latter more prominently).

Metatropes are tropes about tropes, often intended as a knowing wink to the trope-savvy audience. One such example is “Lampshade Hanging”, which TV Tropes describes as:

...the writers’ trick of dealing with any element of the story that threatens the audience’s Willing Suspension of Disbelief, whether a very implausible plot development, or a particularly blatant use of a trope, by calling attention to it and simply moving on.

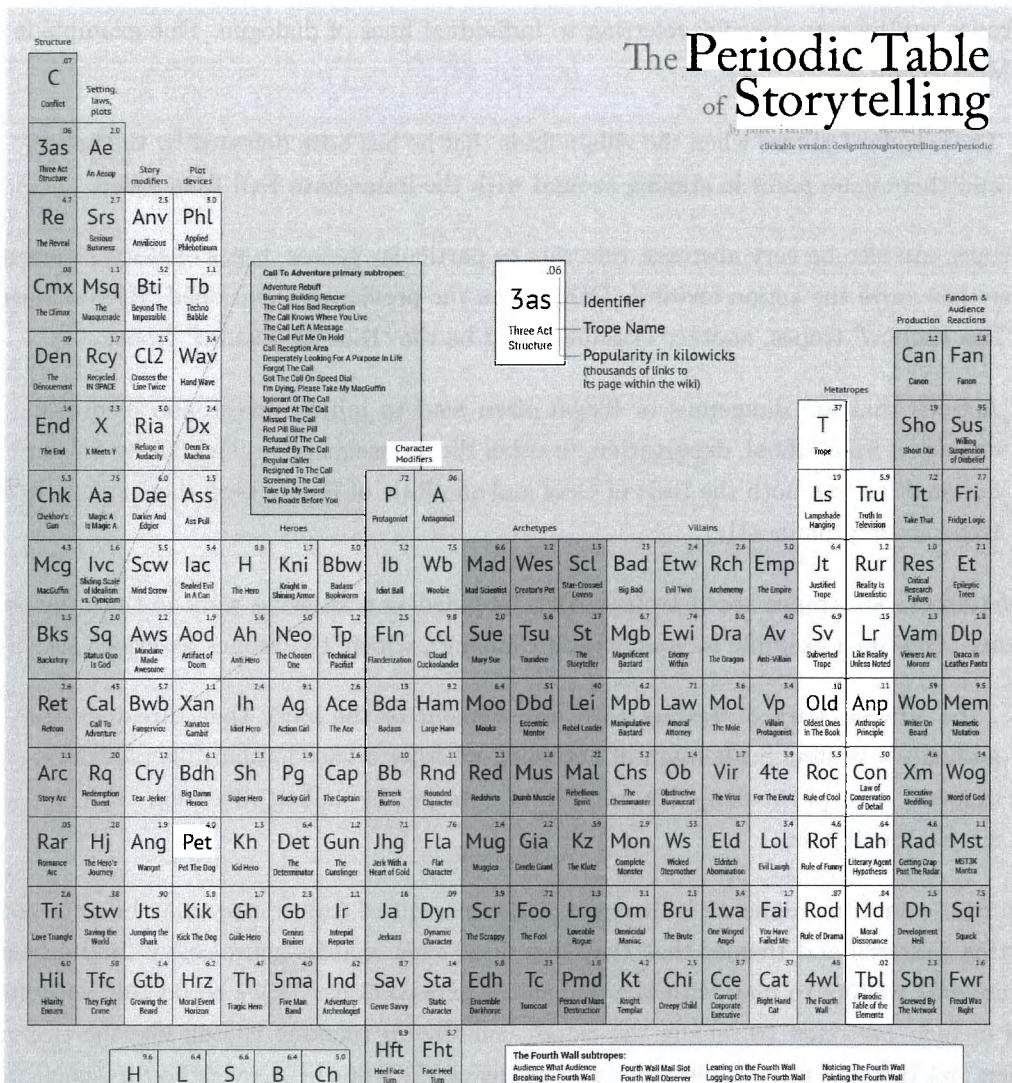
Brackets
In fact, even if an audience is unaware of the concept of tropes, they may be aware of the recurring patterns and themes that they describe. This enables genre-savvy (and especially postmodern) writers to play with the audience’s expectations. Ways to do this with tropes could include *inversion* (reversing the trope), *subversion* (making it look like the trope will happen, but then not using it after all), *parody* (using the trope in an over-the-top, exaggerated manner) and *deconstruction* (using the trope in a straightforward manner, but in a way which forces the audience to analyse the trope itself).

Take, for example, the well-known “The Butler Did It” trope from murder mystery stories, where the butler of the house is revealed to be the murderer at the end of the story. TV Tropes describes ways that an author could “play” with this trope:

- **Subvert** it: The butler is the prime suspect at the beginning, and is later found innocent.
- **Invert** it: The butler is the victim. Or the butler solved the crime. Or every suspect except the butler was part of the crime.
- **Parody** it: Butlers could learn their trade at butler college where they are taught cleaning, cooking, and murdering. *except that murder is an institutional fact*
- **Deconstruct** it: The butler is a revolutionary serial killer, who purposely takes jobs as butlers to murder his rich masters. All the unfortunate implications of class warfare that this suggests are brought up and discussed.

Many other examples of using tropes in this way can be found on the “Playing with a Trope” page of the TV Tropes website TV Tropes (2017b).

① suggest cropping using `im2geohash` to have two figures. Then rescale for width to improve legibility.



These elements can be combined into simple story molecules:

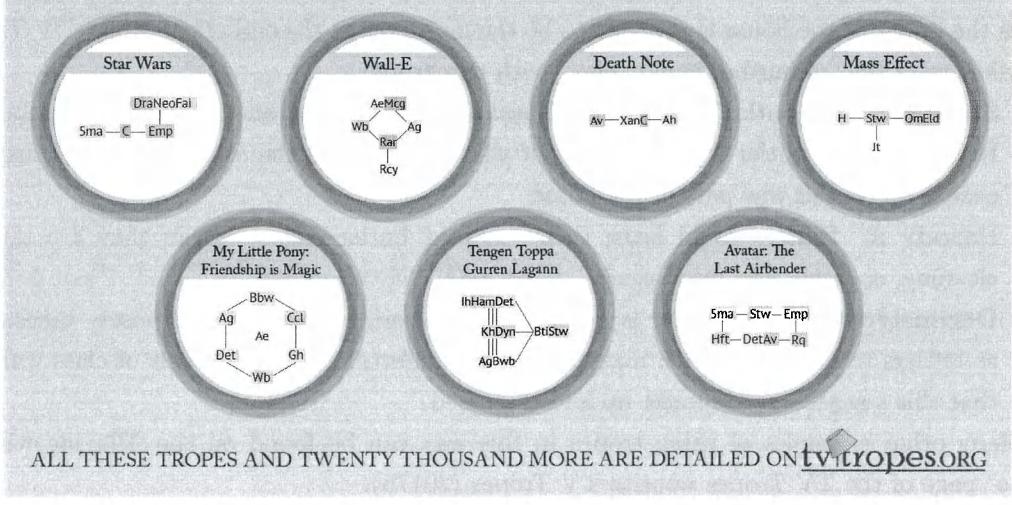


Figure 1-2: The “Periodic Table of Storytelling”, original by James Harris (<http://jamesharris.design/periodic/>), poster⁴format by Deviant Art user Dawn Paladin (<http://dawnpaladin.deviantart.com/art/The-Periodic-Table-of-Storytelling-Second-Edition-425816242>).

① This is very useful/informative. ~~suggests~~ use a list to make it more prominent.

A large and highly active community of users and contributors exists around TV Tropes. In addition to creating content for and curating the content on the website, they also work to create useful ways to visualise the usage of tropes in stories. For example, The Periodic Table of Storytelling (Harris, 2017) is a visualisation of tropes as "elements" in the "molecules" of a story. The table itself (fig. 1-2) arranges the tropes into different "groups" according to the part of a story that they operate on. The leftmost groups describe the story as a whole, describing its *structure* ("Three Act Structure", "MacGuffin", "Chekov's Gun"), *story modifiers* ("Darker and Edgier", "Tear Jerker", "Jumping the Shark"), and *plot devices* ("Hand Wave", "Techno Babble", "Xanatos Gambit"). In the centre of the table are different types of character such as *Heroes* ("Anti Hero", "Action Girl", "The Gunslinger"), *Archetypes* ("Mad Scientist", "The Fool", "Loveable Rogue") and *Villains* ("Evil Twin", "The Empire", "Obstructive Bureaucrat"). The right third of the table contains self-referential tropes such as *metatropes* ("Lampshade Hanging", "Subverted Trope", "The Fourth wall"), and *fandom and audience reactions* ("Fanon", "Fridge Logic", "Freud Was Right").

The story is then visualised as a molecule composed from tropes, linked together as atoms (shown at the bottom of fig. 1-2). *as shown in the various examples in Fig 1-3.*

This visualisation demonstrates the core idea of our use of tropes as reusable story components, but the "molecule" metaphor is unsuitable for a couple of reasons. Firstly, linking tropes together as atoms in a molecule does not communicate the different levels of abstraction at which tropes operate. Considering that our main purpose for choosing tropes as our method of describing narrative components, this means that the "molecule" metaphor used by the author does not match our intentions. The "Hero's Journey" trope, for example, would describe the narrative arc as a whole, while the "Comeuppance" trope would describe just a single scene in the story. The metaphor is also not ideal because it presents orthogonal concepts together in a story with no indication of which part of a narrative they affect. A "scoundrel sidekick" could be linked together with a "breaking the fourth wall" trope, even though one trope relates to a certain character, and the other may describe a single line of dialogue or action that occurs at a specific point in the story.

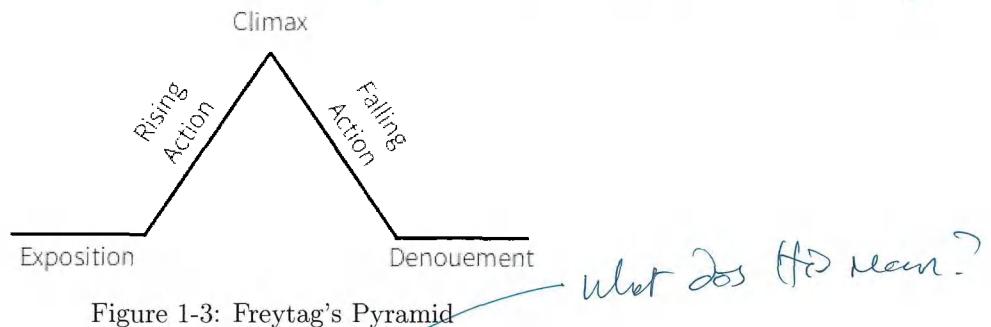
③ Also, the arrangement and linking of the tropes in the example molecules is quite arbitrary. The examples given on the *periodic table* web site form interesting shapes, but do not follow any apparent consistent logic. In the *Star Wars* molecule, for example, the "Five Man Band", "Conflict" and "The Empire" tropes are linked in a straight line suggesting a linear sequence, but three further tropes ("The Dragon", "The Chosen One" and "You Have Failed Me") are all linked to the "The Empire" trope in the molecule. While "The Dragon" refers to the Death Star in the movie, the "The Chosen One" trope is more closely linked to Luke Skywalker's Hero role. The "You Have Failed Me" trope refers to a specific scene where villain Darth Vader punishes an underperforming henchman with choking. It is not clear why the creator decided to link these specific tropes to the "The Empire" trope. *What this illustrates is that such*

Similarly, in the *GhostBusters* example, the "Five Man Band" and "Mad Scientist" tropes appear together in the same "atom", which are linked to "Sealed Evil in a Can" and "Hilarity Ensues". Again, it is not clear why those particular tropes are arranged together into the same

② It is important: take time/space to ensure the reader *fully* understand the implications

③ Paragraphs do not start with *Also*. Is this (anyway) really a paragraph break or should all this material be structured differently?

- ① needs to be more analytical
- ② why be inspired by something you have shown or broken?
- ③ yes, this begins to derive some goals but is rather too brief and superficial



atoms, or why they are linked together in this way. The most likely explanation is that this visualisation of the way that tropes link together in a story is not intended as a serious way to formalise stories, and is merely a "fun" example.

- ①
 - ② Taking this visualisation as inspiration, we develop our concept of tropes as logical, reusable components for the formal description of stories. Importantly, we develop a way to nest tropes within other tropes as sub-tropes as a way to describe tropes acting at different levels of abstraction.
 - ③
- why?
from where
does the motivation
come? It could/
should be demonstrated
through (, horroings)
of the examples
above.

1.2 Why Use Tropes?

Returning to the shortcomings of existing narrative formalisms we describe in section ??, we now describe how tropes are suitable for use as a narrative formalism that is able to overcome these limitations.

1.2.1 A Means of Abstraction

Most tropes exist in a hierarchy of tropes, with parent tropes such as the *Quest* containing child tropes such as *Redemption Quest*, *Sidequest* or a *Quest for Identity*. These child-tropes inherit some of the characteristics of their parents, but add subtle or major changes. For example, a *Quest for Identity* follows the *Quest* format, but is constrained so that the item the hero is questing after is the hero's own identity. This is a mechanism of *inheritance*, so one can imagine using such a process to avoid duplication of effort when authoring new tropes by only expressing how a trope differs from its parent.

Another method of abstraction is to express tropes that are contained as parts of larger tropes. The example we described in section ?? describes how the "Quest" trope could form just one part of a larger trope such as the "Hero's Journey". Another example of this would be the **Three Act Structure** (also known as Freytag's Pyramid) shown in fig. 1-3, which describes the shape of a story in terms of rising and falling levels of drama. This could be split into five (or perhaps more) sub-tropes:

- **Exposition:** The setting of the scene, providing any background information that is relevant to the story.
- **Rising Action:** A series of events drive the story forward, each increasing in dramatic intensity.

- ④ Is it desirable to use inheritance or is this delegation?
- ⑤ Don't follow. Compound tropes that cannot stand alone?

① Does something need to be said about design patterns at this stage (or some point).

- **Climax:** The turning point of the story. Some fateful event occurs as a result of the rising action, which could be a battle between the hero and the villain, for example.
- **Falling Action:** The consequences of the climax play out, and the story shows how the characters are affected.
- **Denouement:** This is the final resolution, where [all] the “loose ends” of the story are tied up.

This means that if we already have trope definitions for the “Exposition”, “Rising Action”, “Climax”, “Falling Action” and “Denouement” parts of a story, and want to create a “Three Act Structure” trope, we can simply express it in the following way:

- The “Exposition” trope happens
- Then the “Rising Action” trope happens
- Then the “Climax” trope happens
- Then the “Falling Action” trope happens
- Then the “Denouement” trope happens

Returning to the concept of “story structure” described in section ??, we can use the “subtropes” we just identified to describe other “story shapes” as defined by Vonnegut. For example, the “man in hole” story shape could be simply described as a rearrangement of the three-act structure:

- The “Exposition” trope happens
- Then the “Falling Action” trope happens
- Then the “Zenith” trope happens
- Then the “Rising Action” trope happens
- Then the “Climax” trope happens
- Then the “Denouement” trope happens

Note that we added an additional trope, the “Zenith” trope to describe the lowest point in the story. Otherwise, the rest of the story “shape” is easily described in terms of tropes that we have defined already.

This re-use of existing trope definitions saves us the time and effort of the wasteful duplication of the steps already described within them. This is why abstraction is such a powerful and useful concept: it allows us to break down complicated stories into a series of smaller sub-stories, rather than having to describe the whole thing in one go.

1.2.2 Conceptually Simple

Most story authors are already familiar with the concept of tropes. In order to evaluate the suitability of their use for the description of narrative components, we presented a preliminary version of our trope-based TropICAL programming language (described in section ??) for story authoring to the Oxford and London Interactive Fiction meetup group.

After a brief presentation on the concept of tropes and how we intend to use them to create an authoring system for interactive narrative, participants were given a questionnaire with the purpose of discovering their familiarity with tropes, as well as finding out how suitable they thought tropes would be as a new kind of formalism for narrative components.

what's the point of putting this here? what is it contributing to the narrative?

There were 18 responses to the questionnaire. The questions and responses were as follows:

What's your interest in Interactive Fiction?

- I'm an author: 5 (27.8%)
- I'm a game developer: 10 (55.6%)
- I write interactive fiction: 5 (27.8%)
- It's my hobby: 6 (33.3%)
- It's my job: 5 (27.8%)
- Other: 2 (11.1%)

What tools do you use to create Interactive Fiction?

- Inform: 3 (16.7%)
- Twinery: 7 (38.9%)
- Unity or other IDE: 8 (44.4%)
- Pure code: 4 (22.4%)
- I don't create interactive fiction or games with narrative: 3 (16.7%)
- Other: 6 (33.3%)

What kind of narratives are you interested in making?

- Linear: 2 (11.1%)
- Non-linear: 11 (61.1%)
- I'm not an author: 1 (5.6%)
- Other: 4 (22.2%)

Are you familiar with the idea of "tropes"?

- Yes, and I have visited the "TV Tropes" website: 15 (83.3%)
- Yes, but I hadn't heard of "TV Tropes": 3 (16.7%)
- No: 0 (0%)

How useful do you think tropes are for authoring interactive stories? (on a scale of 1 - 5)

- 1 (not useful): 0 (0%)
- 2: 2 (11.8%)
- 3: 9 (52.9%)
- 4: 2 (11.8%)
- 5 (extremely useful): 4 (23.5%)

The fact that all of the interactive fiction authors and games developers were already familiar with the concept of tropes demonstrates that they are conceptually simple enough for non-programmers to understand. Not only that, but most of them were already familiar with the TV Tropes website. Compare this with formalisms for narrative components such as Lehnert's Plot Units (Lehnert, 1981), which would only be familiar to computer science specialists. *Sounds like a (hopeful) assertion. Any evidence?*

1.2.3 A Library of Re-usable Examples

One of the major strengths of Propp's system Propp (1968) is that the Morphology is not only a theory: it is also a library of 31 story functions that can be put together by story authors

- ① But your system is not connected in any way to TV Tropes: it's a resource that can be used to or which to base the authoring of (formulation) of tropes.
- ② subjective + unsubstantiated.

to create a narrative. The authors need not create their own story functions, they can simply use the ones that Propp has already created for them.

Our system shares the same strength due to the fact that the TV Tropes website serves as our "library" of story components. In addition, it grants authors the flexibility to create their own tropes which are not already listed on the TV Tropes website.

- ① TropICAL, our domain-specific programming language for trope-oriented story authoring, makes the authoring of story tropes simple for non-programmer users. In the same vein as Inform 7 (Reed, 2010), our language uses a constrained natural language syntax. Further details are described in section 1.5, where we describe the language in detail. In the same manner as a wiki, once a number of authors have contributed tropes, it will become a useful library of reusable tropes for future authors to use in their stories.

could offer the capacity to be ...

- ② To summarise: tropes are an ideal model to use for story components, and fulfil the criteria we laid out in section ??: they provide a means of abstraction through subtypes as well as parent and child tropes, they are conceptually simple for authors to learn, given that most authors are already familiar with them, and they enable us to easily create a library of re-usable examples from the tropes listed on the TV Tropes website.

Certainly not demonstrated.

Section does very little except set up hostages. Consider purpose.

need to contrast these

1.3 Describing Tropes as Institutions

- ③ Rather than strictly telling our story characters what to do to conform to a story arc, we govern their behaviours with social institutions, as described in Section ??.
- ④ An institution describes a set of 'social' norms describing the permitted and obliged behaviour of interacting agents. Noriega's 'Fish Market' thesis Blanco-Vigil (1998) describes how an institutional model can be used to regiment the actions of agents in a fish market auction. Cliffe et al. (2007), Lee et al. (2013) extend this idea to build systems where institutions actively regulate the actions of agents, while still allowing them to decide what to do. Adapting this idea to the world of narrative, we use an institutional model to describe the tropes that occur within a story world.

Institutional models use concepts from deontic logic to provide obligations and permissions that act on interacting agents in an environment. By combining this approach with the idea of tropes, we can create a narrative model in terms of what agents are obliged and permitted to do at certain points in the story. In this way, the tropes are described as social norms which govern the character agents of a story, where an institution describes the norms that govern a certain trope, and a story is a collection of tropes.

In order to describe story tropes in terms of social norms, we break them down into three components:

1. characters, which instantiate roles
2. objects, which instantiate types
3. places, which instantiate locations

Characters' actions are described in terms of permissions and obligations. For example, a character in a certain role *may* go to the cinema, or a character *must* buy a ticket before the movie begins, otherwise they will not see it. Note that an obligation (which says that a char-

- ⑤ Not clear to me that this has been demonstrated. Perhaps walk through the ⁹ required criteria arguing how they have been met.
- ⑥ Can this be quantified? If not I think it needs to be stated more convincingly.

Reference may be wrong, but Noriega's thesis is not really an extension of it. It's a script, but the telling of a story is a script, therefore inside both and contrast.

⑦ Suggest this needs to start from what you want to do with it. A strategy to achieve rather than how to do it.

① He justification for this (jump) is missing

② and why is this desirable?

③ Does not seem like a very good example: anyone can pick up a lightsaber.
What point do we want to make?

acter *must* do something) can have a deadline ("before the movie begins") and a consequence ("they will not see the movie"). These are both optional in our system.

Returning to the tropes described in the introduction, we can express them in terms of social norms:

- **The Hero's Journey:** The hero *must* leave home when they receive the call to adventure. Then the hero *may* kill the villain. Once this is done, the hero *may* return home.
- **The Evil Empire:** The villain has an empire, and *may* kill the hero.
- **MacGuffin:** The hero *must* search for an object. However, the hero *may* find it.
- **Chekhov's Gun:** If a weapon appears in the beginning, it *must* be used before the end of the story.

Describing tropes in terms of permissions and obligations is enough for us to be able to specify them as social norms, but also we need to be able to determine which norms hold at any point of a story. For this, we use an *Answer Set Programming* (ASP) approach to describe our tropes in order to use an answer-set solver. We do this with the aid of *InstAL* (Cliffe et al., 2007), the Institution Action Language, a language for describing social institutions, which compiles to AnsProlog. This allows us to use trope models and an ASP solver to determine which norms hold after agent or player actions have occurred in the story world.

In *InstAL*, external events trigger institutional (internal) events. External events are the actions of the character agents in their environment. For example, an agent playing the role of Luke Skywalker in a Star Wars game may pick up a Lightsaber. Since Luke Skywalker is a hero character, and a Lightsaber is a type of weapon, this would trigger an institutional event where a hero has picked up a weapon. Institutional events initiate and terminate fluents inside the institution, which may describe the institutional state, and which permissions and obligations currently hold. So when Luke Skywalker picks up a Lightsaber, the institutional event could initiate his permission to use the weapon, or an obligation to go to the land of adventure. For more details on *InstAL*, social institutions, and the formalism in figures 1-4 and 1-5, refer to (Cliffe et al., 2007).

Figure 1-4 lists some external ($E_{external}$) and institutional (internal, $E_{internal}$) events for the *Hero's Journey* trope. A wide range of external events such as *go*, *meet*, *kill*, *escape* generate the *intHerosJourney* internal event, but only if the external event meets certain criteria. These criteria could be whether or not an agent fulfils a certain role, for example. Figure 1-5 shows examples of such internal event generation (\mathcal{G}). In the first example (rule 1.3), the *intHerosJourney* event is generated when Luke Skywalker goes to Tatooine, but only if Luke has the role of *hero*, and Tatooine's location is *home*. Figure 1-5 shows how internal events initiate (\mathcal{C}^\uparrow) fluents and norms (permissions and obligations) in a trope. Because the *Hero's Journey* trope has several stages, this example only shows the first two phases of the trope (this is explained further in the "Sequencing" part of the "TropICAL: a DSL for Tropes" section). Rule 1.6 shows how the *intHerosJourney* internal event initiates the hero's permission to kill the villain, an obligation for the hero to go to the Land of Adventure before the villain kills the victim, and the next phase (phase C) of the *Hero's Journey* trope. These fluents

Does reader know enough about the formal model?

number

④ In general this presumes a lot of knowledge on the part of the reader.

And will lead to a lot of "why" questions that can be avoided by providing a fuller discussion + motivation.

⑤ This also presupposes too much about how the model is constructed.

6 would be a good idea to explain this aspect of the intro to trope example reading

This all needs major revision: approach from perspective of someone who does not know what you are trying to do or how you are doing it.

$$\mathcal{E}_{\text{external}} = \left\{ \begin{array}{l} \text{go(Agent, Place)}, \\ \text{meet(Agent, Agent)}, \\ \text{kill(Agent, Agent)} \\ \text{escape(Agent)} \end{array} \right\}$$

$$\mathcal{E}_{\text{internal}} = \left\{ \begin{array}{l} \text{intHerosJourney(Agent,} \\ \text{Agent, Place, Place)} \end{array} \right\}$$

Better to explain this is a computational model of narrative but not one for non-programmers, rather it provides the (semantic) bridge between natural language and ~~that~~ ASP.

Figure 1-4: External and institutional events (\mathcal{E}) for the *Hero's Journey* trope

are only initiated if the *intHerosJourney* internal event happens while the trope is in phase B (when *phase(herosJourney, phaseB)* holds), however. Fluent termination (C^\downarrow) works in a similar manner to initiation, with permissions and obligations for previous trope phases being terminated once the next phase of a trope has been entered. Examples for the first two phases of the *Hero's Journey* trope are shown in figure 1-5.

While InstAL allows us to express tropes as social institutions, it would be difficult to use for non-programmers who are unfamiliar with logic programming paradigms. In order for story authors to be able to create their own tropes, a much more user-friendly language is needed. This is the motivation for TropICAL, the domain specific language we describe in the next section.

1.4 Punch and Judy as Tropes

In section ??, we describe the *sausages* scene of Punch and Judy in terms of Propp's story functions. We begin this section in the same way, by building up a scene description in terms of tropes. Then, as in section ??, we create an institution out of the scene we have described with our formalism.

On the TV Tropes page for Punch and Judy, it lists the following tropes (quoted directly from the site):

- **Amusing Injuries:** People are often beaten up.
- **Audience Participation:** The children are expected to reply to Mr. Punch's Catch Phrase, "That's the way to do it" with a shout of "Oh no, it isn't!"
- **Black Comedy:** So black that many modern versions are often heavily censored compared to more historical stagings.
- **Catch Phrase:** "That's the way to do it!", "HE'S BEHIND YOU!", etc.
- **Comedic Sociopath:** Mr. Punch
- **Commedia dell'Arte:** Punch is based on the *Pulcinella* character.
- **Crosses the Line Twice:** Good showings will definitely do this.
- **Hand Puppet:** All of the characters, except the baby, are puppets (though originally marionettes).
- **Head Bob:** Traditionally the puppets don't have articulated mouths, and use head bobbing to indicate which one is speaking.
- **Ironic Echo:** There's at least one rendition of the act where Punch ends up playing

Quite technical for this stage of the narrative but could work if embedded in sufficient explanatory / motivational narrative context.

The generation relation \mathcal{G} for trope state \mathcal{X} and external event \mathcal{E} in the *Hero's Journey* trope:

$$\mathcal{G}(\mathcal{X}, \mathcal{E}) : \left\{ \begin{array}{l} \langle \{role(lukeSkywalker, hero), \\ \quad location(tatooine, home)\}, \rightarrow \{intHerosJourney(lukeSkywalker, \\ \quad R, S, tatooine, T)\} \rangle \\ go(lukeSkywalker, tatooine) \end{array} \right. \quad (1.3)$$

$$\left. \begin{array}{l} \langle \{role(lukeSkywalker, hero), \\ \quad role(obiWan, dispatcher)\}, \rightarrow \{intHerosJourney(lukeSkywalker, \\ \quad obiWan, R, S, T)\} \rangle \\ meet(lukeSkywalker, obiWan) \end{array} \right. \quad (1.4)$$

The fluent initiation relation \mathcal{C}^\uparrow for trope state \mathcal{X} and internal event \mathcal{E} in the *Hero's Journey* trope:

$$\mathcal{C}^\uparrow(\mathcal{X}, \mathcal{E}) : \left\{ \begin{array}{l} \langle \{phase(herosJourney, phaseA)\}, \\ intHerosJourney(hero, dispatcher, villain, \\ \quad home, landOfAdventure)\} \rangle \rightarrow \left\{ \begin{array}{l} \text{perm(meet(hero, dispatcher))} \\ \text{phase(herosJourney, phaseB)} \end{array} \right\} \end{array} \right. \quad (1.5)$$

$$\left. \begin{array}{l} \langle \{phase(herosJourney, phaseB)\}, \\ intHerosJourney(hero, dispatcher, villain, \\ \quad home, landOfAdventure)\} \rangle \rightarrow \left\{ \begin{array}{l} \text{perm(kill(hero, villain))} \\ \text{obl(go(hero, landOfAdventure),} \\ \quad \text{kill(villain, victim),} \\ \quad \text{viol(story, end))} \\ \text{phase(herosJourney, phaseC)} \end{array} \right\} \end{array} \right. \quad (1.6)$$

The fluent termination relation \mathcal{C}^\downarrow for trope state \mathcal{X} and internal event \mathcal{E} in the *Hero's Journey* trope:

$$\mathcal{C}^\downarrow(\mathcal{X}, \mathcal{E}) : \left\{ \begin{array}{l} \langle \{phase(herosJourney, phaseA)\}, \\ intHerosJourney(hero, dispatcher, villain, \\ \quad home, landOfAdventure)\} \rangle \rightarrow \left\{ \begin{array}{l} \text{perm(go(hero, home))}, \\ \text{phase(herosJourney, phaseA)} \end{array} \right\} \end{array} \right. \quad (1.7)$$

$$\left. \begin{array}{l} \langle \{phase(herosJourney, phaseB)\}, \\ intHerosJourney(hero, dispatcher, villain, \\ \quad home, landOfAdventure)\} \rangle \rightarrow \left\{ \begin{array}{l} \text{perm(meet(hero, dispatcher))} \\ \text{phase(herosJourney, phaseB)} \end{array} \right\} \end{array} \right. \quad (1.8)$$

Figure 1-5: Generation events, and fluent initiation and termination for the *Hero's Journey* trope

one trick too many on Snap the Crocodile, who promptly eats him (off-stage, of course) and returns repeating Mr Punch's "da-da-da" sound, culminating in a mock belch.

- **Karma Houdini:** In many versions, Punch is a psychopath who kills his own baby by throwing it out of a window, beats his wife to death with a stick, kills several other characters whom he encounters and finally outwits the devil himself to get away completely scot free.
- **Refuge in Audacity:** The entire show, especially the violence, is played as outrageous comedy.
- **Slapstick:** The style of the show, even named after the type of stick Punch uses.
- **Throw the Dog a Bone:** In some shows Judy will get her hands on Punch's stick and beat him with it. Though this is usually followed by Punch snatching it back and beating her with it.
- **Unsympathetic Comedy Protagonist:** Mr. Punch
- **Values Dissonance** Possibly the best example of this as Punch's domestic abuse of Judy is completely played for laughs.

Feels like this needs more support.

- **Villain Protagonist:** Mr. Punch

Some of these tropes are useful in our construction of the story as a whole in terms of tropes, while others are not. For example, the *Commedia dell'Arte* trope would be difficult to express in a way that would influence our interactive narrative. Instead of describing the entire story of Punch and Judy, we will describe the sausages scene first mentioned in section ?? in terms of tropes, using this one piece of the story as an illustrative example. To help with this translation, TV Tropes even has a page on Vladimir Propp which maps his story functions directly into tropes TV Tropes (2017c):

1. Joey tells Punch to look after the sausages (*Rule Number One*).
2. Joey has some reservations, but decides to trust Punch (*Deal with the Devil*).
3. Joey gives the sausages to Punch (*Mentor Archetype*).
4. Joey leaves the stage (*Parental Abandonment*).
5. A Crocodile enters the stage and eats the sausages (*Don't Touch It, You Idiot!*).
6. Punch fights with the Crocodile (*Earn Your Happy Ending*).
7. Joey returns to find that the sausages are gone (*Where It All Began*).

Here are the tropes mentioned above, described in more detail:

Rule Number One (interdiction) TV Tropes actually describes two separate versions of this trope:

- a situation where a character makes rules to govern a dangerous or uncomfortable situation (one such example being “The first rule of Fight Club...”, which is in itself a trope of its own).
- when a Mentor Archetype conveys advice or admonishments to another character, such as “Don’t use the dangerous forbidden technique!” or “Always believe in yourself!”.

In the case of our scene, the interdiction seems to be the second type listed here.

Deal with the Devil (complicity) The classic incarnation of this trope is the 16th century legend of Faust selling his soul to Mephistopheles. It involves a desperate pawn (Faust) signing a magically binding contract with a corrupt, exploitative trickster (Mephistopheles, or any Satan-like character).

In this scene, Punch would be the corrupt exploiter, with Joey the Clown as his pawn.

Mentor Archetype (Receipt / provision of a Magical Agent) TV Tropes describes this as “A more experienced advisor or confidante to a young, inexperienced character, particularly to a hero.”.

Due to our stretching of the original Propp function definition, this trope does not fit what we want to express: the simple act of Joey giving the sausages to Punch. Joey does not really fulfil the Mentor role. Additionally, TV Tropes’ translation of “Receipt of a Magical Agent” from Propp to “Mentor Archetype” is questionable: there is no mention of a Magical Agent in this trope, only of the Mentor who provides it. We must look for a better-fitting trope in this case.

Parental Abandonment (absentation) This trope is straightforward: the protagonist is abandoned by their parents (emotionally or physically). In the case of the trope, it is described as something that drives or influences the protagonist, such as in the case of the

character Bruce Wayne: the death of his parents early on forced him to become the superhero Batman. This differs from Propp's function (and our Punch and Judy example), in which the absence of parental or supervisory characters leads to mischief from the protagonist, and the violation of the earlier interdiction. This trope appears to be defined flexibly enough to fit this interpretation as well, however.

Don't Touch It, You Idiot! (violation) The title of this trope does not entirely convey the nuance of its meaning: TV Tropes defines it as any order or interdiction that is inevitably violated at some point later in the story. This actually fits well with Propp's original definition, which stated that the "interdiction" and "violation" story functions must always go together, as one inevitably leads to the other.

Earn Your Happy Ending (struggle) This trope states that the characters in a story must face far more difficulty than usual, overcoming more obstacles than most characters would have to face. However, the characters get a happy ending as a result of their struggles.

Again, this does not fit our scene where Punch fights the crocodile for the sausages. Though it does describe a struggle of sorts, it is more of a comedy fight than anything arduous for the characters involved. We can probably find a better match for this trope.

Where It All Began (return) This trope does not match the definition of "return" that we have used from Propp: in our case, it describes the return of a supervisory character some time after they went away during the *absentation* function. TV Tropes' definition describes more the return of the protagonist to their hometown at the end of the *Hero's Journey*. In this case, we need to find a trope that is the counterpart to the "Parental Abandonment" function from earlier, which describes the return of the "parents" of that particular trope. The problem is the slight mismatch in the definition of the trope against the Propp function we are using. In the most literal case of the trope, the "parents" cannot return: they are dead. Again, this indicates that perhaps we must find tropes that more closely match Propp's definitions of *absentation* and *return*. ~~HTS~~

From our deeper analysis of TV Tropes' mappings of Propp story functions to tropes, a number of issues have arisen:

- Our use of Propp's story functions may be a little too "flexible". This means that the mappings of the functions we have used add an extra layer of interpretation to the translation, taking us away from the original intended meaning.
- Tropes, by their very nature, are a little ambiguous and open to interpretation. The same trope could even be expressed in multiple different ways, such as the "Rule Number One" trope.

In place of TV Trope's suggested "struggle" trope, *Earn Your Happy Ending*, a more suitable trope to use would be the *Chase Fight*:

Chase Fight: An X meets Y cross between a Chase Scene and a Fight Scene.

This is far more suited to our purposes, as the scene simply consists of the crocodile fighting Punch by chasing him around the stage.

Similarly, in the place of the "absentation" and "return" tropes, *Parental Abandonment* and *Where It All Began*, TV Tropes has a more suitable pair to use:

Put on a Bus: a character is written out of a story so that they may (possibly) return later.

The Bus Came Back: when one of the (main) characters returns back into the story.

Though this trope pair better captures the essence of the leaving and return of Joey, what if we also wanted some of the nuance of the *Parental Abandonment* trope? The beauty of the capturing tropes as institutions is that we can use both sets of tropes and let the player and character agents decide the outcome, which could be a set of actions from a mixture of both tropes.

For simplicity, we can remove the “Deal With The Devil” trope, as well as “Rule Number One”. The “Don’t Touch It, You Idiot” trope includes the interdiction that we wanted to express through the “Rule Number One” trope. Also, as the “Deal With The Devil” trope involves a lot more than the simple complicity with which Joey goes along with Punch’s plans, it can be safely omitted.

This leaves us with just four tropes that describe our scene: *Don’t Touch It, You Idiot*, *Put on a Bus*, *Chase Fight*, and *The Bus Came Back*.

Trope Roles

The character roles that appear in trope descriptions in TV Tropes differ greatly from the *Dramatis Personae* defined in Propp’s morphology. For each of the four tropes, we identify the following roles:

- **Don’t Touch It, You Idiot:** the *owner* (Joey) and the *idiot* (Punch)
- **Put on a Bus:** the *absentee* (Joey)
- **Chase Fight:** the *chaser* (Crocodile) and the *pursued* (Punch)
- **The Bus Came Back:** the *returnee* (Joey)

Clearly, this means that each character must adopt multiple roles throughout the course of a narrative. In this scene alone, Joey the Clown plays the roles of *owner*, *absentee* and *returnee*. Punch himself must be an *idiot* and the *pursued*.

These roles are not strictly defined in the descriptions found in TV Tropes, and must be inferred by the reader. Furthermore, these roles do not describe character archetypes such as *Hero* or *Comedic Sociopath*. One interesting way to approach this issue could be to have an archetype inherit certain character roles. For example, a *Comedic Sociopath* could automatically fill the roles of *murderer*, *idiot*, *pursuer*, and *chaser*. This idea, while promising, is outside the scope of this thesis, and so is discussed further only in the “future work” section ??.

1.4.1 Return to the Sausages Scene

Using the same process with which we described the *Hero’s Journey* in terms of an institution in section 1.3, this section shows the translation of the *Don’t Touch It, You Idiot* into a formal institution.

First, we define the sequence of events that form the trope:

- The *owner* has an *object*

- Then the *owner* tells the *idiot* to protect the *item*
- Then the *owner* goes away
- Then the *idiot* breaks the *item*
- Then the *owner* returns
- Then the *owner* fights the *idiot*

This is the simplest possible interpretation of the trope. It is possible for other interpretations to exist: for example, rather than the *owner* returning and fighting the *idiot*, something bad might happen to the *idiot* instead. In our TropICAL language, alternative outcomes can be expressed using the *or* operator (sec. ??) allowing the creation of more flexible tropes which could be interpreted in multiple ways. *cater for branching story lines.*

Now that we have determined the events that occur as part of the trope, we can describe its domain fluents, which include all the actions of the characters, as well as their roles:

$$\mathcal{D} = \{\text{owner, idiot, absentee, chaser, pursued, returnee, item, onstage, offstage}\}$$

Also based on the above sequence events is the list of actions that may be permitted to occur within the trope:

$$\begin{aligned} \mathcal{P} = & \{\text{perm(go(offstage, absentee)), perm(go(onstage, returnee)),} \\ & \text{perm(chase(chaser, pursued)), perm(tellprotect(owner, idiot)),} \\ \Rightarrow & \text{perm(give(owner, idiot, object)), perm(break(idiot, item)),} \\ & \text{perm(fight(owner, idiot)))}\} \end{aligned}$$

Trope Phases

While arranging these four tropes in a linear sequence describes the *sausages* scene for the most part, our use of the *Don't Touch It, You Idiot* trope in place of both of Propp's *interdiction* and *violation* story functions introduces an extra challenge to its implementation as an institution: it has two different *phases*. The first phase is triggered by one character warning another character not to do something, the second is when the warned character performs the forbidden action.

In fact, the *Don't Touch It, You Idiot* trope can be divided into several phases, or steps:

- The *owner* has an *object*
- Then the *owner* tells the *idiot* to protect the *item*
- Then the *owner* goes away
- Then the *idiot* breaks the *item*
- Then the *owner* returns
- Then the *owner* fights the *idiot*

This is the simplest possible interpretation of the trope. It is possible for other interpretations to exist: for example, rather than the *owner* returning and fighting the *idiot*, something bad might happen to the *idiot* instead. In our TropICAL language, alternative outcomes can be expressed using the *or* operator (sec. ??) allowing the creation of more flexible tropes which

isn't this the same as at the
top of the page?

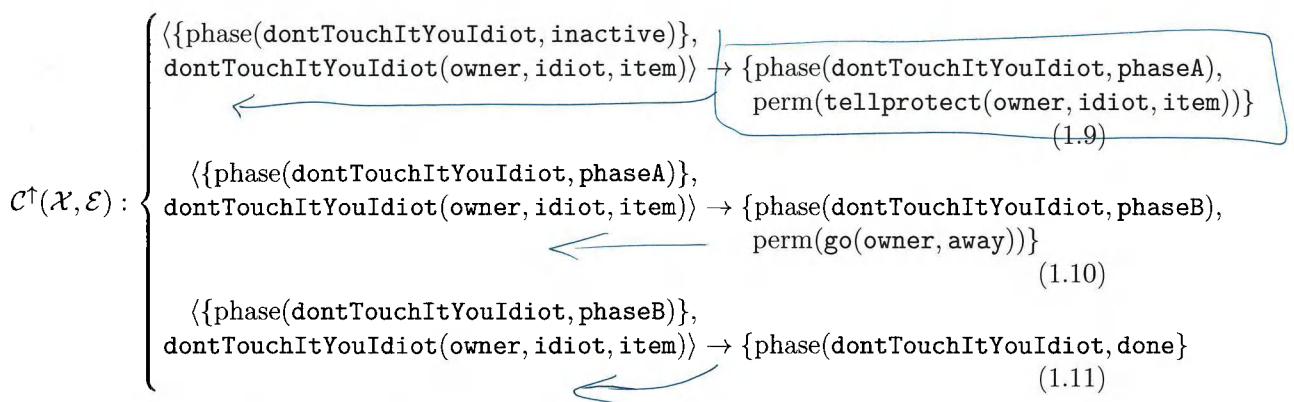


Figure 1-6: Phase fluent initiation in the sausage scene

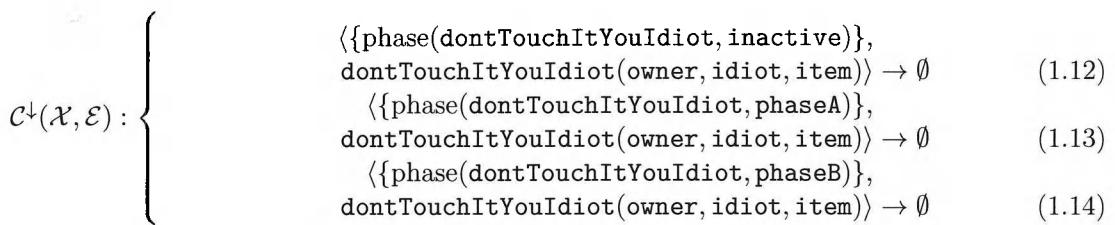


Figure 1-7: Phase fluent termination in the sausage scene

could be interpreted in multiple ways.

In order to properly describe the scene in terms of the four tropes, we must first describe the mechanism by which we divide this trope into separate phases. This is done through the addition of a *phase* fluent which takes a trope (institution) name and its current phase as parameters, such as: *(phase(intTropeName, phaseA))*.

At first, each trope is “inactive”, reflected in the *phase* fluent as *(phase(intTropeName, inactive))*. After each event that occurs in the trope, its phase is updated, starting at *phaseA*, then *phaseB*, through to *phaseZ*. Once a trope has finished (its final event has happened), its *phase* fluent is set to *(phase(intTropeName, done))*. It is set to *done* rather than *inactive*, because there may be situations where we want to check whether or not a trope has already appeared, so that it may not be repeated for example.

Returning to our *Don't Touch It, You Idiot* example, fig. 1-6 shows how a short version of the *Dont Touch It You Idiot* trope with just two phases would be described with *phase* fluents that are initiated according to their corresponding events, with fig. ??.

Extending this example to include all events, along with the corresponding permissions and obligations that they grant our story characters, results in the sets described in fig. ??.

1.5 TropICAL: a DSL for Tropes

We propose TropICAL (the TROPe Interactive Chronical Language) as a DSL for describing tropes in a constrained natural language, which we compile to InstAL Cliffe et al. (2007), through which process we capture the events that can occur and the consequent state changes,

Justification reads a more operational than requirements driven.

and from which a model is constructed in ASP. The model, when given an event trace, delivers the evolution of the trope state, including crucially, the addition or removal of permission associations between actors and actions and the addition of obligations as consequences of actors' actions. The syntax of TropICAL is heavily influenced by the Inform 7 (Reed 2010) language for interactive fiction, with the tropes being expressed in constrained natural language mostly conforming to Attempto Controlled English (ACE) (Fuchs and Schwitter 1996). TropICAL shares similar aims to Inform 7 in that it aims to make interactive fiction authoring accessible to non-programmer story authors, however its focus is on authoring and combining tropes written in terms of roles, in contrast to complete stories in terms of actual characters. This section describes the syntax and semantics of TropICAL, as well as sketching its compilation to InstAL.

The features of our trope description language are designed to be able to express the events, permissions and obligations of social institutions while addressing the shortcomings of planner and drama manager-based approaches:

- R1. A way to express what certain characters are **permitted** to do at a given time.¹
- R2. A way to express **obligations** on characters, with *deadlines* and *penalties* if the obligations are not fulfilled. *institutional* *can one deserve the state of a character?*
- R3. A way to describe the state of a **character** or object at a given point in the story.
- R4. A way of **sequencing** events in a trope.
- R5. A way to express **conditionals**, so that some events may occur only if others have.
- R6. A way to have **branches** in a trope, so that only one of two events may occur.
- R7. A way to **embed** sub-tropes inside of parent tropes.

Requirements R1 to R4 allow TropICAL to describe the permissions, obligations and sequences of events that occur in social institutions, while R5 and R6 add the ability to specify alternative paths through a story, as planner-based systems are able to do when combined with formalisms such as Propp's. Finally, requirement R7 enables us to nest tropes to go beyond the capabilities of structuralist formalisms of narrative, addressing the limitations described in the "Related Work" section of this paper. The TropICAL language satisfies these technical requirements, while being easy to learn for non-programmers, especially those familiar with the Inform 7 language (as is supported by the evaluation). It supports the expression of the above features in the following ways:

Permissions: Permissions on characters can be described by making statements in the simple present form, such as "The Hero finds a weapon". When compiled to InstAL code, these statements are equivalent to giving a character permission to do something. In this case, the Hero would have permission to find a weapon at that point in the trope. The reason that this statement is translated to a permission is so that character agents can at any time have multiple permitted actions from several active tropes. It makes sense to make permission the "default" norm, rather than obligation, to allow the agents as much

¹An alternative approach would be to specify prohibitions, such that anything not prohibited is permitted, whereas we currently specify permissions, such that anything not permitted is prohibited. This latter convention is the default semantics of InstAL, it is however straightforward from a technical point of view to adopt the alternative, as demonstrated in King et al. (2015).

① consider presenting this as a motivation (i.e. first) rather than an explanation (i.e. second).

- 1 "The Hero's Journey" is a Trope where:
- 2 The Hero is at Home
- 3 Then the Hero meets the Dispatcher
- 4 Then the "Quest" trope happens
- 5 Then the Hero returns Home

Figure 1-8: The "Hero's Journey" trope in TropICAL

- 1 "The Evil Empire" is a Trope where:
- 2 The Villain has an Empire
- 3 The Empire is a Weapon
- 4 The Villain has a Victim
- 5 The Villain may kill the Victim
- 6 The Villain may kill the Hero

Figure 1-9: The "Evil Empire" trope in TropICAL

- 1 "Quest" is a Trope where:
- 2 Then the Hero must go to the Land Of Adventure before the Villain kills the Victim
- 3 Otherwise, the Story ends
- 4 When the Hero goes to the Land Of Adventure:
- 5 The Hero may rescue the Victim
- 6 The Hero may kill the Villain
- 7 Or the Villain may escape

Figure 1-10: The "Quest" trope in TropICAL

freedom as possible within the constraints of the story. If an author wants to make sure an agent carries out a particular action, they would specify it as an obligation instead ("The Hero *must* find a weapon").

Obligations: Fig. 1-10 shows an example of an obligation with both a deadline and a violation event (both of which are optional). This obligation states that the hero must go to the Land of Adventure before the villain kills the victim, otherwise the story ends. In this case, the story ending is a particularly harsh penalty for the violation of the *Quest* trope. Alternative violation events could be reduction of the hero's health, or the death of the victim.

State: There are certain properties of each character or object in a story that will hold (or not hold) at different points of time. For example, we want to be able to keep track of the physical location of each character or object, what items a character possesses, or the state of their health, for example. There are two keywords that we use to express the state of a character: *is* and *has*.

For example, we can say that: The *sword* **is** in the *castle*. The *hero* **is** at *home*
Or: The *hero* **has** the *sword*. The *villain* **has** the *macguffin*.

These statements would be used to initiate and terminate fluents in their corresponding institutions. The state of the story will progress according to the combination of fluents that hold at a particular time.

Sequencing: As well as specifying permissions and obligations, it is frequently necessary to

be able to express that certain events can only occur in a certain order. The *Then* keyword means that the succeeding statement can only occur once the previous event has occurred. This is the means of implementing the *phases* described in the “Ordering Events in Tropes” part of this section. In the *Hero’s Journey* (Fig. 1-8) example, the Hero only has permission to return home (line 5) once everything in the *Quest* trope has happened (Fig. 1-10). In some tropes, such as the *Evil Empire* trope (Fig. 1-9), the permissions and obligations described do not always need to occur in a certain sequence. In this case the trope serves the purpose of describing certain themes and characters in a part of a story, or events that may occur at any time, rather than in a specific order. The *Evil Empire* trope only needs a villain with an empire to be present to fight the hero, so all of its permissions and obligations will apply from the beginning of the story.

Branching: Tropes may also contain branching paths where one or more events may take place. This is expressed in TropICAL with the *Or* operator. Lines 6 and 7 of the *Quest* trope in Fig. 1-10 express two alternatives: the Hero may kill the Villain or the Villain may escape. In this case, both permissions will hold at the same time, but both will be terminated once either permitted event has occurred. This makes it impossible for both events to happen in the story.

Conditionals: Conditionals are another way to create branching paths in a narrative, by allowing certain actions to occur if a particular trope state is reached. For this purpose we add the *When* keyword, to express that when a specified state or event occurs, then some norms will be activated. In our *Quest* example, we see an example of this on line 4, stating what the hero may do once in the Land of Adventure. This is similar to the “Simple Present Statement” example, except for the addition of the *When* keyword. In much the same way, the statement after the *When* keyword is a permission that holds on a character during the trope, except that it is also used to describe the consequences of certain events occurring. In this case, it states that when the Hero goes to the Land of Adventure, they may either kill the Villain, or the Villain may escape.

Embedding Tropes Within Tropes: Tropes can be embedded inside other tropes by simply writing *The X trope happens*. Line 4 of the *Hero’s Journey* trope (Fig. 1-8) shows an example of embedding one trope inside another. In this case, the *Quest* trope occurs at a certain point in the *Hero’s Journey*, once the hero has met the dispatcher character. Because this is sequenced using the *Then* keyword, these events must occur in the specified order, and the norms described in the *Quest* trope cannot hold until the specified point in the trope. However, if the *Then* keyword is omitted (*The “Quest” trope happens*), this means that the norms contained inside the embedded trope apply from the start of its containing trope. In our example, this would mean that the Hero would be free to embark on a quest at any time, rather than waiting to first meet a dispatcher character.

Rather than compiling all the tropes into one institution, they are compiled into separate institutions and *coordinated* using a “bridge” institution. This technique, described by (Li, 2014), allows institutions to generate events *inside* of other institutions while

connected

keeping each one separate. The cross-institution event generation logic is described in the “bridge institution” section of the next chapter (sec. ??).

Summary

This chapter has described the concept of tropes, breaking down several examples and describing them as normative institutions. We then returned to our *Punch and Judy* example to describe a scene in terms of tropes rather than Propp functions. Using this knowledge, we created a set of requirements for the creation of a domain specific language for describing tropes that compile to formal descriptions of institutions in terms of social norms, as well as a high-level overview of the features of the language we have created (named *TropICAL*).

The next chapter describes the actual implementation of *TropICAL*, with snippets of code for example tropes and their corresponding translations to *InstAL*.

Says what chapter contains but does not justify and/or analyse and emphasize what to carry forward.

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