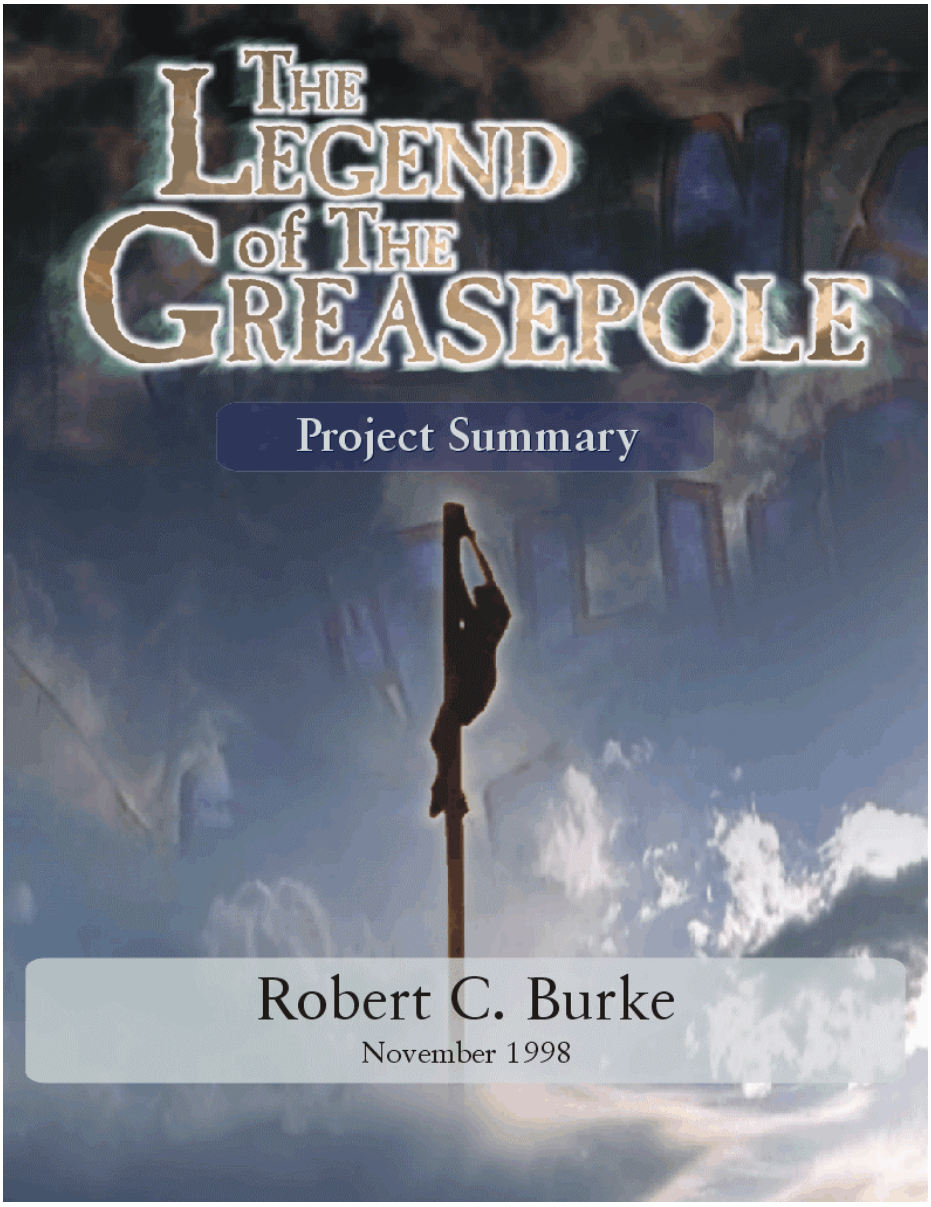
The Legend of the Greasepole Project Summary



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Executive Summary

The Legend of the Greasepole is a multimedia tribute to the ultimate Orientation Week event for undergraduate Applied Science students at Queen's University at Kingston, Ontario. It is distributed on a CD that contains these two components:

- *The Pole Game*, an interactive experience set at the Greasepole event; and,
- *The LegendWeb*, a multimedia history of the Greasepole with an anthology of Queen's engineering traditions.

The Pole Game showcases *IntelliFrosh*, an engine designed to facilitate goal-driven, behavior-based groupwork among synthetic characters. The eighty-five frosh characters in the game learn to work as a team to form a human pyramid, climb the greasepole and remove a Scottish tam from its top. The player can employ more than a dozen humorous methods to stall the frosh and keep them from this goal for as long as possible.

The *IntelliFrosh* engine incorporates the five features that Dr Bruce Blumberg of the MIT Media Lab identifies as fundamental to a system for generating synthetic characters: relevance, persistence & coherence, adaptation, intentionality, and integration of external control. *IntelliFrosh* also provides the 85 autonomous characters interacting in *The Pole Game's* world with the capacity to learn and teach new methods for achieving complicated goals.

The Legend of the Greasepole's development spanned a period of two years and involved the work of over 50 members of the Queen's student community. Robert Burke, Queen's University Math and Engineering Class of '99, acted as Project Manager, Lead Programmer, and Editor-in-Chief of the LegendWeb. He designed and implemented the *IntelliFrosh* system in C++. Craig Calvert, formerly a Queen's University Mechanical Engineering student, acted as Artistic Director during the second year of the project. He designed and rendered the majority of the artwork that appears in *The Pole Game*.

Figure 1: One frosh leaps from the human pyramid, while another yanks at the tam on top of the Greasepole in this screenshot from *The Pole Game.*

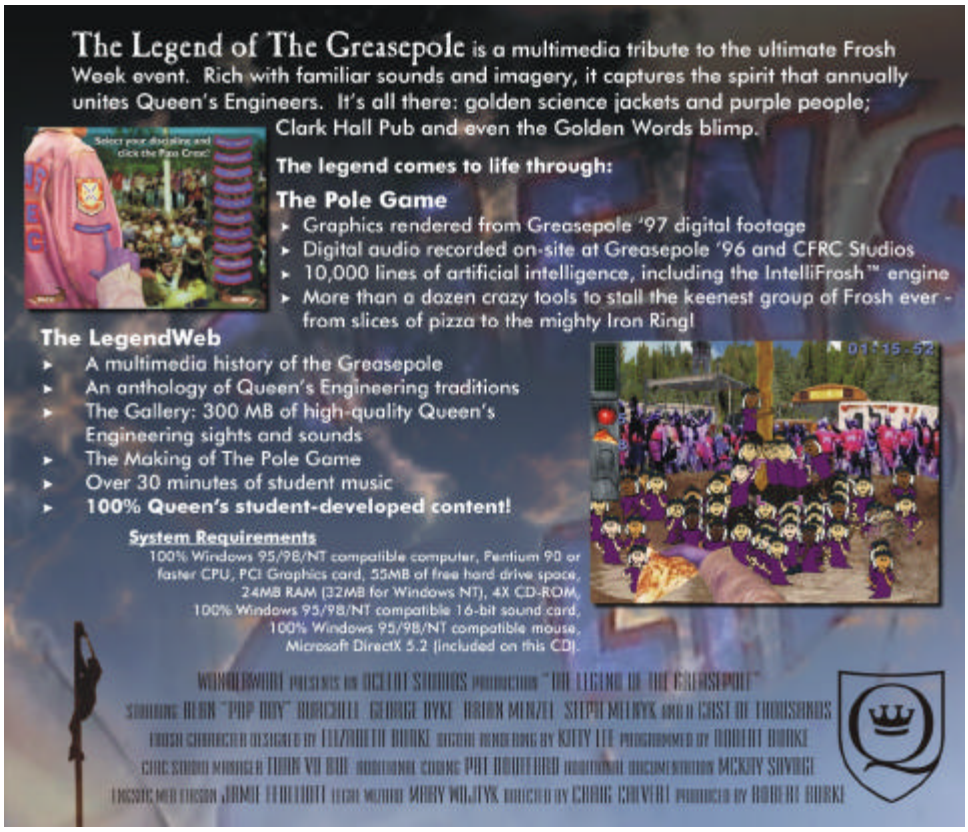

Figure 2: ***Legend of the Greasepole*** **CD tray card.**

About this Document

This document provides a technical overview of the *Legend of the Greasepole* project. It is divided into three main sections:

- ***Functional*** describes the contents of the *Legend of the Greasepole* CD.
- ***Technical*** describes the *IntelliFrosh* engine that powers the artificial intelligence of *The Pole Game*. *IntelliFrosh* governs the behavior of the frosh (first-year students), the crowd and all other agents in the game. This section also describes several significant technical aspects of *The Pole Game's* development.
- ***Personal*** describes the role that project management played in the successful completion of *Legend of the Greasepole*.

Terms in this document that have been borrowed from the local Queen's University lingo are explained the first time they are used, and summarized in a glossary at the end of the document.

The document is followed by several images, including the following:

- Copy of the advertisements sent to Queen's University Alumni and 250 high-tech firms prior to release of *Legend of the Greasepole.*
- Copy of the first official description of the *Legend of the Greasepole* project, presented to alumni at the Math and Engineering 30th Anniversary Reunion, August 1997.

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LEGEND

1. Introduction

1.1 The Greasepole Event

1.1.1 Beginnings

October 8th, 1955, Varsity Stadium, University of Toronto.

The University of Toronto staff watch proudly as the football game against Queen's University comes to an end. Thanks to their new "indestructible goals," this will be the first Queen's victory that won't end with the visiting fans taking home the goalposts.

Or so they think.

Queen's students rush the field, give the goalposts a collective heave, and down they come. The night before the game, an undercover team of Queen's engineers had cut partway through the two north-end poles, leaving just enough uncut metal to support them during the game.

Figure 3: Science '55 borrows the University of Toronto "indestructible" goals (Cover of Tricolour Yearbook '55.)

The poles were spirited off to Kingston and put to good use. The engineers of Queen's Applied Science class of '59 reenacted an old tradition: cover a goalpost in grease, nail a Scottish tam to the top, and initiate the first-year students by having them find some way to get the tam off!

1.1.2 Evolution

Today's Greasepole events are a far cry from the climbs of the 1960s and 1970s. Axle grease has given way to three inches of lanolin oil as a goopier but more sanitary Greasepole lubricant. Four hundred *frosh* (first-year students) arrive by bus and are welcomed with a roar from a purple-dyed crowd. Music blares from a podium from which the Engineering Society president looks down with pride, and the frosh leap into a pit filled waist-deep in clean but *frigid* water.

Unlike axle grease, a coat of lanolin makes the pole impossible to scale, and so today's frosh must *learn to work as a team*, form a human pyramid and remove the tam from the top. If they take too long, upper-year students are invited to help the frosh in their efforts. It is perhaps the only time in their academic careers that *all* the engineers at Queen's work towards a common goal.

Modern climb times have been as low as 96 minutes (Science '98) and as high as three hours and seven minutes (Science '97). The event always ends with the frosh victorious. They are officially declared an Applied Science Year… and classes begin on Monday morning.

1.2 The Legend of the Greasepole

1.2.1 A Legend is Born

On Canada Day, 1996, I sat with a group of Queen's Engineers on Parliament Hill in Ottawa, Ontario. I had been thinking for some time about how futile all previous attempts to "capture" the spirit of the Greasepole had been. Perhaps the most successful – *Pillar of Wisdom*, a short film about the event – conveyed the danger involved in the event, but neglected to comment on the team-building aspects of the climb. I wondered if the spirit, the energy, the team building and the excellence that embody a modern Greasepole event could be captured with an interactive experience.

Figure 4: Greasepole 1992. (From Tricolour Yearbook, 1992).

1.2.2 From Vision to Gold

Two Greasepoles, 10,000 lines of code and 500 megabytes later, and with the assistance of over 50 enthusiastic friends**,** The *Legend of the Greasepole* was ready for its official release on the big screen at Clark Hall Pub, the watering hole of choice for Queen's engineers. Just like at the real pit, the game's frosh only succeed when they *learn to work as a team*, taking advice from upper year students like Al "Pop Boy" Burchell, a local legend who dives into the pit to help them out. And just like real life, the game tells the story of the inevitable victory of the frosh over the Pole.

Included on each of the 1000 CDs we burned is *The LegendWeb*, over 500 megabytes of multimedia that flesh out our presentation of the greasepole experience. Within the LegendWeb lies some explanation of why Queen's Engineers are known as the most spirited people in the world. It includes information about the academic programs at Queen's, the history of the Greasepole, and the making of The Pole Game.

Figure 5: Greasepole 1999. The author is in there somewhere.

2. Functional: About the Game

2.1 At A Glance

Certainly the best summary of *The Legend of the Greasepole* is found on the back of the CD's jewel case.

Figure 6: *Legend of the Greasepole* v1.14 tray card.[1]

[1] 1.14 is the first release of Legend of the Greasepole. See the Glossary for information about Physics 114 to appreciate why the CD was given this version number.

2.2 In More Detail

2.2.1 The Pole Game

The Pole Game begins as 85 artificially intelligent frosh are tossed into the pit through a roaring crowd. You view the action through the eyes of a *Frec* (upper-year student) standing on the bank of the pit. The premise is that you and some of your co-Frecs have noticed that the frosh this year are particularly keen. They'll likely climb the pole in record time, and not learn the teamwork they'll need to survive their upcoming Applied Science education. You have to *stall the frosh* for as long as possible as they attempt to climb the Greasepole.

As the game progresses, the frosh will learn new tricks, become more resilient to your attempts to stall them, and genuinely learn to work together. Should they have problems, they will be assisted by Alan "Pop Boy" Burchell, an upper-year student who will jump into the pit and accelerate their learning process.

2.2.1.1 Gameplay

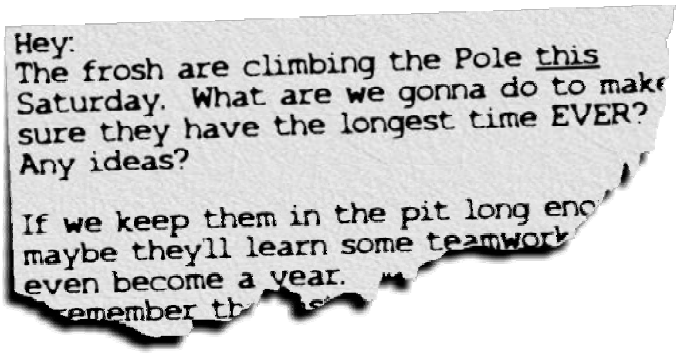
The game is controlled by a mouse-driven interface. You can use the mouse to perform the following actions:

- Click the left mouse button to toss whatever's in your hands towards the pulsing crosshairs. If you are holding an apple, hold down the button to wind up. A power bar at the upper-left of the screen will indicate your wind-up strength.
- Click on apples, pizza, beer and exams that are offered to you with the left mouse button to grab them.
- Click on the firehose if it is offered. A power bar at the upper-left of the screen will indicate the water remaining in the truck.
- Click on the icons of apple, pizza, beer and exams to toggle between weapons, or else click the right mouse button anywhere on the screen.
- Click on ArtSci (Arts and Science) and Commie (Commerce) students with the left mouse button to push them into the pit.
- Do *not* click on a SciCon (Science Constable) or throw things while they are present. They will administer a Tri Pub Ban. *(See the glossary.)*
- Should the Iron Ring forge swing out three times, click on the spinning Iron Ring that appears to unleash its powers.

Figure 7: Player unleashing the power of the mighty Iron Ring**.**

2.2.1.2 Tactics (Top Secret!)

There are over a dozen ways to stall the frosh, the details of which are not revealed anywhere on the *Legend of the Greasepole* CD. Cryptic suggestions for how the weapons might be used are found on the inside of the booklet that comes with the CD.



Here is a synopsis of the "tools" available for you at the greasepit.

Pizza

You can wield pizza in the game by grabbing it from the delivery guy who pops up at the front of the screen. This staple food of University students everywhere also doubles as a pit-side tool. Toss it sidearm into the pit by clicking the left mouse button. It's not a very effective "weapon," but a hungry frosh that catches the pizza may stop to eat it. Hurling it in the water is more strategic – frosh who have high hunger drives may come running for the slice.

Eating pizza stalls a frosh, but also sates their hunger and increases their strength.

Apples

Two crowd members occasionally offer you a basket of apples during the game.[2] You can click the left mouse button to throw, or click and *hold* the left mouse button to wind up a stronger shot. Apples can also be tossed at the Crowd, the Engineering Society President, and just about anywhere else you'd like to cause unrest. How do you like *them* apples?

Your ability to knock frosh down is a function of their strength. As the game progresses, the frosh will become increasingly resilient. Eating pizza, for example, increases their ability to withstand an apple toss. Being hit with an apple first lowers a frosh's strength, but then raises it above its original level. This is meant to reflect an increased resolve to avoid being knocked down by another apple, as well as an increased understanding of how to avoid being affected by an apple attack. Clearly the apples are only a short-term solution, even when thrown after length wind-ups.

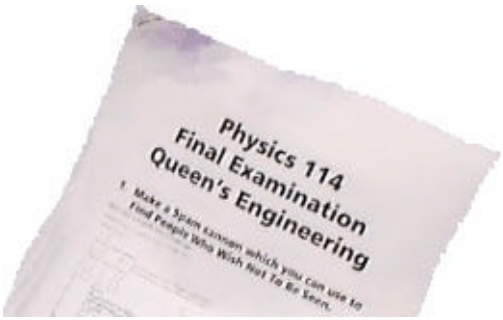
[2] Please note that apples have not been available at "real life" Greasepole events since the mid-1970s.

Clark Hall Pub Mug o' Grog

An inebriated member of the crowd occasionally offers you a keg of beer that can be used to fill up your Clark Hall Pub mug.[3] It would be a shame for it to go to waste, so use the right mouse button to drink from the elixir. If you're willing to click the left mouse button and part with some of it, the allure and subsequent effects of 6.5% ethanol can be put to good use. As with the pizza, a thirsty frosh may grab the beer and chug it. Tossing a mug of beer into the water can result in a free-for-all in which the frosh go scrambling for the prize.

Drinking beer lowers the intelligence of a frosh, and sometimes has the immediate effect of having them do something stupid (like jumping off the pyramid, or stopping to sing). However, it has the effect of increasing their strength (perhaps their *perceived* strength?) and also sating their desire for more beer.

Physics 114 Exam



Once ranked the third most hideous piece of paper on the planet, Phys 114 exams should be handled with care. In the game, some keener has brought his old exams to the pit and occasionally offers one to you.

Click the right mouse button to check your examination paper over and make sure there are no pages missing. (There are instructions for how to build a "Spam Cannon" on the paper in the game. A Spam Cannon is essentially a modified Potato Gun.) Click the left mouse button to toss an exam at the frosh. The frosh will scatter in every direction. Only a frosh with an *extremely* high intelligence level will not be affected by the exam. The 114 Exam thus gives new meaning to the phrase *"smart bomb."*

Tossing the 114 exam at the frosh can devastate their attempt to form a pyramid, but it also increases their overall intelligence level quite a bit. Perhaps they're learning by osmosis.

Firehose

The CD booklet explains that someone this year has a friend at the fire department. They've brought a fire truck to the pit so that the Frecs can get the frosh hosed.[4]

The firehose is in the game for "fun" more than anything else. It sends the frosh flying, but like the apples, it ends up increasing their strength. A meter at the top of the screen indicates how much longer the hose can run before it runs out of water. Water drips out fairly quickly even if you're not actively spraying.

[3] Please note that at a real-life modern Greasepole event, alcohol is prohibited; sometimes art can be more fun than real life.

[4] True story: They did this for real back in the 1970s.

ArtScis (Arts and Science Students)

Arts and Science Students: they're cute, they're lovable, but they don't belong at a private engineering event. If one shows up, give 'em a shove with the left mouse button.

Many of the frosh will stop what they're doing to come and splash the alien in the pit. The thrill of splashing ArtScis, however, tapers off fairly quickly after the first splash attack or two.

Commies (Commerce Students)

Commerce Students: See "ArtScis" above, but omit the "cute" and "lovable" bits.

What more can one say about Commies that won't result in a million-dollar lawsuit? A click of the left mouse button is worth a thousand words.

Golden Words Blimp

The Golden Word blimp occasionally flies by and launches a cartoon hippopotamus at the frosh to confuse them. Golden Words is the campus engineering newspaper; the blimp is found on their masthead and the hippo is their mascot.

The hippo causes some unrest and marginally affects the intelligence level of the frosh it touches. There's no real way to "induce" a blimp attack; it's just a fun random event.

Iron Ring

Every graduate of a Canadian engineering program wears an iron ring on the little finger of his or her working hand. The ring itself symbolizes both the **pride** we have in our profession and, at the same time, our **humility**. The rings were originally crafted from the twisted iron that remained after the first bridge ever constructed in the province of Quebec collapsed due to a design flaw. A subsequent inquiry revealed the flaw to have resulted from an error in judgement made by the bridge's engineers.[5]

In the Pole Game, you can earn the right to don your iron ring at the greasepit. If you can keep the crowd, the Engineering Society President and Al "Pop Boy" Burchell excited and happy, an Iron Ring Forge will swing on to the screen and begin pressing your ring. After it has swung out three times, your ring is forged and you can put it on by clicking the icon of a spinning ring with your left mouse button.

[5] The bridge was part of the National Trans-Continental Railway linking Winnipeg, Manitoba, to Moncton, New Brunswick. Construction began on the bridge in 1900. On August 29, 1907, as the bridge neared completion, it collapsed under the weight of a locomotive loaded with steel. Seventy-five people lost their lives in the disaster. A second attempt to span the river resulted in catastrophe on September 11, 1916, when the center span of the bridge fell while being hoisted into place. This time, ten more lives were lost. The bridge was finally completed in October 17, 1917, and has since been renamed the *Pierre LaPorte Bridge*. Although the rings are no longer made from the steel of the bridge, the significance of the Iron Rings remains unchanged.

The ring's effect in the game is both symbolic and humorous. It temporarily turns the frosh into animals – sheep, and cows with the wings of eagles. The sheep poke fun at the "brainwashing" that goes on during frosh Week, and the tendency the frosh have to follow like sheep just about anything their Frecs do or say. The cows with wings of eagles are a reference to a chant sung during orientation week, which the author shall not be repeat here but is more than willing to sing upon request.

The equations that determine when the iron ring forge will swing out are driven by a cumulative sum of the "excitement" that your actions produce during the game. There are also 16 "special" actions that, when performed for the first time, significantly reduce the amount of "excitement" required to forge the ring. These include:

- Pushing an ArtSci or Commie into the pit
- Throwing an apple at an ArtSci or Commie in the pit
- Feeding the Golden Words hippo
- Tossing a Physics 114 Exam
- Feeding the crowd pizza and beer (especially until they "slam their jackets" – a tradition among Engineers at Queen's).
- Drinking beer from your own mug
- Feeding the Engineering Society President pizza and beer
- Feeding Al "Pop Boy" Burchell pizza and beer (especially beer)
- *… and others that are just too cool to give away here.*

2.2.1.3 Other Aspects of the Game

The crowd cheers and responds to everything going on in the game. They are powered by a set of *IntelliFrosh* behaviors similar to but less complex than those employed by the frosh (see Section 3.2.1 for more information).

After the human pyramid topples a half-dozen times, the Engineering Society president invites Al "Pop Boy" Burchell into the pit to help the frosh out. Al is a local legend who stands over six foot five and has been of assistance to the frosh at past Greasepoles. His effect is twofold: first, he strengthens the base of the pyramid by the equivalent of five frosh; second, he teaches the frosh climbing and balancing techniques that would otherwise take them a great deal of time to learn individually.

2.2.2 The LegendWeb

Included on the *Legend of the Greasepole* CD is a vast information resource detailing the Applied Science program at Queen's. Its contents are geared towards current and prospective students, as well as alumni. It consists of text, graphics and sounds laid out on the CD in HTML format. The result is platform-independent, and can be displayed using a Web browser on a computer running any modern operating system. The topics covered by the LegendWeb include:

- ***Legends*** – The traditions and history of Queen's Applied Science, co-authored with McKay Savage, Queen's Applied Science '99.
- ***Gallery*** – The images and sounds of Queen's Applied Science program. Hundreds of megabytes of stock footage recorded for the game were put to use here.
- ***Visions and Betas*** – A look at how *The Pole Game* and *The Legend of the Greasepole* CD were designed and implemented. Also includes information about the IntelliFrosh engine.
- ***Academics –*** Information about the Applied Science programs offered by Queen's University.
- ***Outlook –*** A forum for organizations like Queen's Project on International Development *(QPID)* and the Conference on Industry and Resources *(CIRQUE+)* to showcase their recent activities.
- ***Community –*** A look at how Applied Science students give back to the community, from Science Quest (a summer camp for primary school students run out of Queen's) to the Queen's Project on International Development.
- ***Traditions*** – From Iron Rings to Purpled Jackets, a look at the roots of the Applied Science program. If the glossary of this document missed something, or you want to know more about the strange spectacle of the Greasepole, this section is sure to answer your questions.
- ***Society –*** A description of the inner workings of the Engineering Society.
- ***Pole Game Documentation –*** A fun and colorful introduction to *The Pole Game*. Includes a description of how to play, an explanation of some of the traditions seen in the game, and the credits. Not nearly as explicit as this document.
- ***Contacting Us–*** How to get in touch with the developers of *Legend of the Greasepole*.

3. Technical: IntelliFrosh

3.1 The frosh Character and IntelliFrosh

***IntelliFrosh* is the** behavior-Based Artificial Intelligence engine developed by Robert Burke that governs the behavior of the frosh and other sprites in the game.[6]

3.1.1 About IntelliFrosh

The actions of the frosh character are governed by 31 behaviors that encompass over 5,000 lines of code. Although the details of these behaviors have changed over the course of the project, the core of the artificial intelligence has changed very little since its inception in the winter of 1996. After working on IntelliFrosh for a year, Robert Burke had a chance to take notes in September of 1997 while watching Science '01 climb their Greasepole. Sample pages of his notes – mud and lanolin stains included – are found in the LegendWeb. He used these observations to improve *IntelliFrosh's* simulation of the transition from chaos to order at the greasepit.

Each of the 85 frosh thinks for his or herself 24 times a second, and there is no "overmind" that controls the horde. They base their decisions on the interaction of over 15 *internal characteristics* that describe their motivations, and their knowledge of the game world.

Watch the frosh the next time you play the game. Their first few attempts to climb the pole will end in dismal failure, regardless of how slack the player is in trying to stop them. Each time the human pyramid topples, groups of frosh will stop to think and regroup. Notice how each attempt brings them a little closer to their goal as they exhibit more cohesive teamwork.

3.1.2 Overview of frosh Behaviors

The frosh behaviors are best understood as arranged in the four-tiered system of Figure 8. Each behavior the frosh exhibit consists of an "initialization" function and an "action" function. Every frosh sprite tracks a pointer to the function serving as the current behavior for that character.

The first tier of behaviors, numbered 1 through 3, manages frosh under the influence of gravity. The frosh fall with little or no control over their actions.

The second tier – behaviors 4 through 7 – manages frosh in the greasepit water. Behavior 4 is a sort of "hub" for the artificial intelligence at this tier. A frosh may make a decision based on *internal characteristics* and *perceived state of the game world* to transfer between behavior 4 and behaviors 5, 6 and 7. A frosh exhibiting behavior 7 may choose to exhibit behavior 9 and climb out of the water as a function of their ambition, level of excitement, and knowledge of weight ratios. These characteristics all vary as the game progresses. For example, one way in which the artificial frosh mimic their human counterparts is that they start out keen to climb up the human pyramid. Just about everyone wants to be a hero, and the resulting human pyramid becomes top-heavy. As the game progresses, the frosh learn to exercise caution before climbing up.

The third tier – behaviors 9 through 14 – manages frosh dealing with the upper levels of the human pyramid. As they climb they are being influenced by weight on their shoulders, and they apply weight on the shoulders of those beneath them. A significant amount of the learning in the frosh pertains to how they handle situations encountered at this tier in the behavioral structure. Frosh need to know when to stay put and when to climb up. They need to know if they should beckon

[6] The author's compatriots here at Queen's University cautioned him against using the words "Intelligent" and "Frosh" in the same sentence; alas, he contracted them into a single *word*).

other frosh up, jump down to reduce the weight of the pyramid, or balance the weight *across* the level they are on. They need to know *not* to accept beer and pizza if it's tossed to them, and they need to avoid putting too much weight on the shoulders of any of their compatriots below.

The fourth tier of behaviors manages the various incarnations of behavior 16 – tugging on the tam. The tam loosens as frosh yank on it in an attempt to get the nails out. A strong tug has a greater loosening effect, but also increases the chances that the frosh will slip. Chewing at the tam can expedite the process but can also cause a frosh to slip.

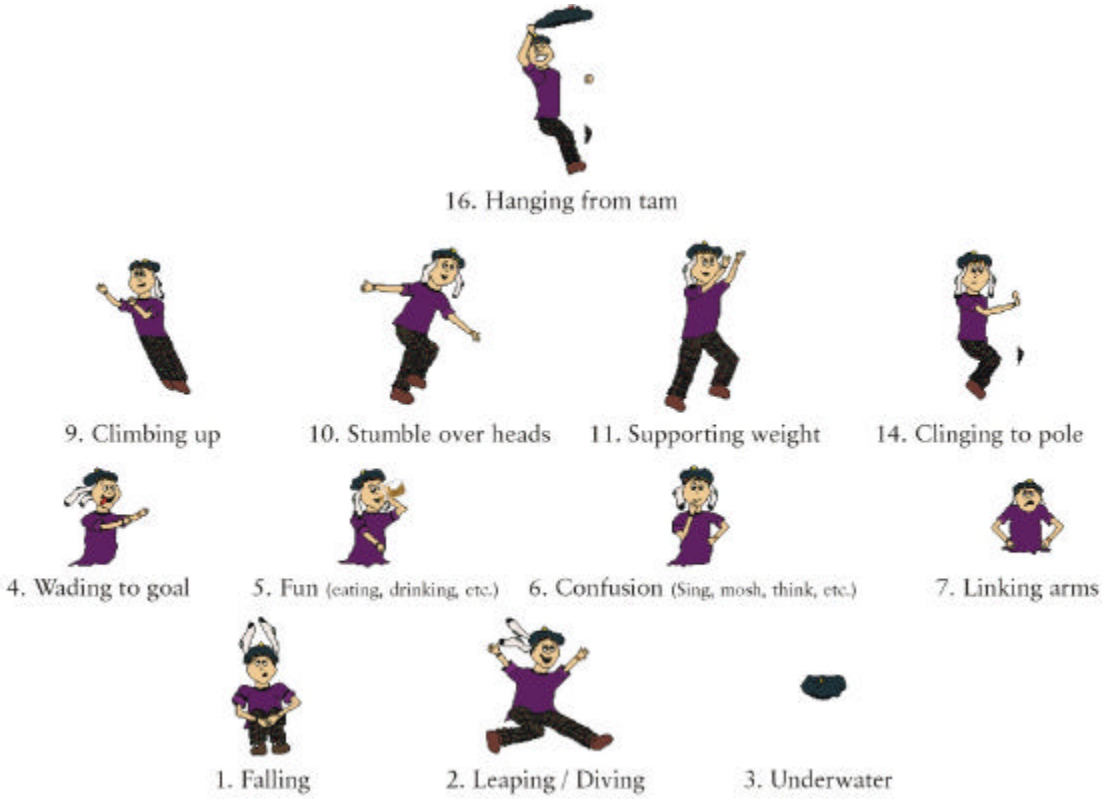


Figure 8: Groups of behaviors available to the frosh character, arranged in four tiers.

The following is a complete list of the behaviors frosh are able to exhibit. *Unused* behaviors are a result of modifications made to the behavior list during development.

- **1** – Free-falling into pit
- **2** – Leaping into pit
- **3** – Underwater
- **4** – Wading through pit towards a goal (or target)
- **5: "Fun stuff"**
  - **5A** – Eating pizza
  - **5B** – Drinking beer
  - **5C** – Splashing ArtSci
  - **5D** – Pushing/Splashing Commie
- **6: "Confusion"**
  - **6A** – Drunken Singing

- **6B** – Moshing
- **6C** – Swimming Through the Pit
- **6D** – Scratching Head / Communicating / Picking nose
- **6E** – Flying as cow-eagles (Iron Ring effect)
- **6F** – Grazing as sheep (Iron Ring effect)

- **7: "Pyramid Base"**
  - **7A** – Linking Arms at base of human pyramid
  - **7B** – Bucking under pressure at base of human pyramid
- ***8*** *– Unused*
- **9: Climbing up**
  - **9A** – Climbing over shoulders to a level above the water
  - ***9B*** *– Unused*
- **10** – Stumbling over necks towards the pole
- **11: Providing upper-level support**
  - **11A** – Arms up to support people above
  - **11B** – Walking across the pyramid to balance weight
  - **11C** – Beckoning other frosh up to this level
  - **11D** – Eating pizza up high
  - **11E** – Drinking beer up high
- ***12*** *– Unused*
- ***13*** *– Unused*
- **14** – Clinging desperately to the pole
- ***15*** *– Unused*
- **16: Hanging on to the tam**
  - **16A** – Reach and yank on tam
  - **16B** – Lost grip and hanging off tam
  - **16C** – Light tug
  - **16D** – Heavy tug
  - **16E** – Teeth tug
  - **16F** – Holding aloft the tam… *victorious!*

3.1.3 Integer-based internal characteristics

Each frosh keeps track of eight integer-based and six Boolean internal characteristics. These range from their ability to sustain weight on their shoulders, to their thoughtfulness when approaching a climbing decision.

The following listing of integer-based internal characteristics for the frosh provides some insight into the metrics on which they base behavioral decisions. Typically, each of these characteristics is adjusted multiple times a second for every frosh.

attrBehavior	The number of the current behavior being exhibited by the frosh
attrGoal	The frosh's goal (ranging from "Senseless Wandering" to "Get into a pyramid spot" to "go splash that ArtSci") [goalMINDLESS_WANDERING, goalPYRAMID_SPOT, goalCLIMBING_UP, goalBOOSTING_UP, goalBOOSTED_UP, goalCLARK, goalPIZZA, goalARTSCI, goalCOMMIE, goalTHINK, goalMOSH]

attrMotivation	General motivation level [3..20]
attrStrength	General strength and resilience [3..20]
attrFrame	Frame of current behavior (if applicable)
attrPersonality	Frosh's personality (goofy, heavyweight, hoister, climber); adjusts their propensity to perform various actions.
attrUpperLevelGoal	If the frosh gets to an upper level, what are they likely to do? Cling to the pole, climb higher, or support people above them? This changes their propensity to do any of the three. [upperGoalCling, upperGoalClimb, upperGoalSupport]
attrMindSet	The current mindset of the frosh. Originally intended to provide the ability for a "thought bubble" about the head of a frosh, it takes into account their hunger, thirst and other drives and arrives at an predominant mindset. [mindsetMotivated; mindsetExcited; mindsetHungry; mindsetThirsty; mindsetDrunk]
attrPyramidLevel	Which level of the human pyramid the frosh is at [0 = none, 1 = base… 6 = hanging on to tam].
attrEthnicity	Static throughout game. Allows for different skin tones.

3.1.4 Boolean-based internal characteristics

Similarly, these are the Boolean-based internal characteristics for the frosh. Several of these are functions of integer-based internal characteristics that are stored in Boolean format to expedite calculations.

attrExcited	Is the frosh rowdy enough to be running with his or her tongue out?
attrLookingLeft	Self-explanatory; used for graphics rendering
attrLookingAtScreen	Self-explanatory; used for graphics rendering during climbing actions
attrWeightOnShoulders	Is there a hurtful amount of weight on this frosh's shoulders?
attrThirsty	Is this frosh thirsty enough to even *consider* running for a mug of beer?
attrHungry	Is this frosh hungry enough to even *consider* running for a slice of pizza?

3.1.5 Global properties

In addition, there are a number of "global" properties that affect all of the frosh. Although this was not part of the original plan, Robert elected to include these properties after studying non-artificial frosh climbing the pole. The influence of group psychology at the greasepit is undeniable. This is modeled with *IntelliFrosh* as a *morale* metric that adjusts the other internal characteristics of the frosh.

3.1.6 Improvements over time

Because the primary drive the frosh experience throughout the game is to satisfy their desire to climb the greasepole, the internal characteristics of the frosh tend to adjust themselves to facilitate more effective pole climbing. They are also affected by the actions of the player. For example:

- A frosh that is being beamed with apples suffers a temporary reduction in strength; however, his or her strength will then *rise* to represent an increased resilience and ability to withstand attack.

- A frosh that is fed pizza will no longer be hungry.
- Frosh enjoy splashing ArtScis, but the thrill grows old fast. A high intelligence level or a high motivation level can negate the allure of an ArtSci in the pit.
- Tossing the 114 Exam makes the frosh scatter, but their intelligence goes up a notch as they learn from it (by osmosis).

3.1.7 Knowledge "Boosters"

The frosh also benefit from eight different "boosters" that represent knowledge of advanced pole-climbing techniques. These techniques are based on the real climbing methods employed by the frosh at Greasepole '97.

Here is an example of a moment at which a critical decision needs to be made: What should a frosh do when on an upper level of the pyramid with only one frosh above them and a number of individuals beside them? Climb up? Hold fast? Jump off and reduce the overall weight of the pyramid? Beckon others up?

It became clear as development progressed that these sorts of decisions are critical to the evolution of a "teamwork" model for the frosh. The graph to the right (with "time" on the x-axis and "value of booster" on the y-axis) shows how the different characteristics periodically improve. (This image is of a rough sketch made while developing the code.) The introduction of Pop Boy into the pit (at the 6th time unit on this graph) triggers an increase in understanding in the frosh that provides them with a much better sense of how to distribute weight throughout the pyramid structure.

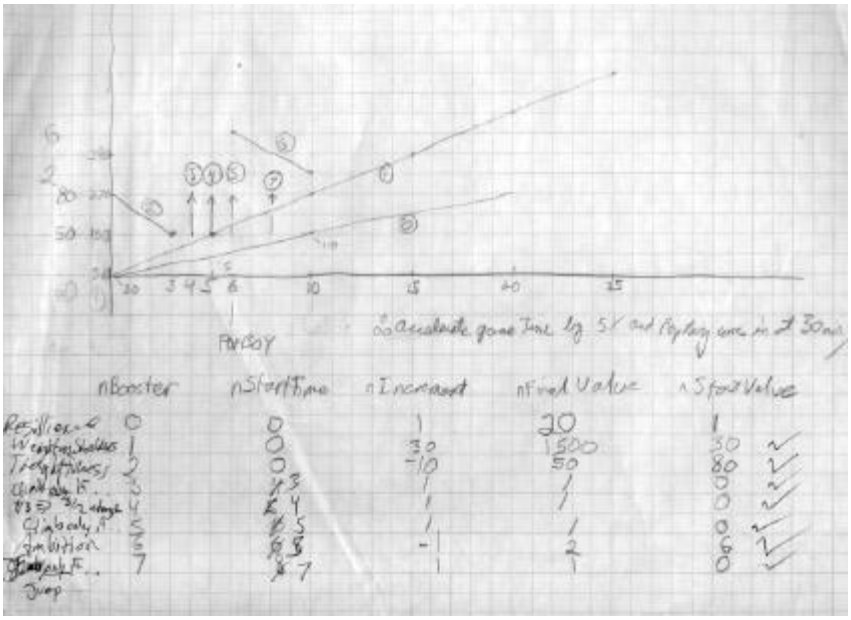


Figure 9: Rough sketch of "booster" logic found in LegendWeb.

Alan "Pop Boy" Burchell provides a knowledge boost each time he hollers at the frosh. For example, his line "Build up the base, frosh; you need a strong base or it *all falls down*," teaches the frosh the importance of balancing weight between the various levels of the pyramid.

The performance boosts available to a frosh include the following:

- Heightened ability to resist the temptation to drink beer or eat pizza.
- Ability to make decision to *jump* from a high level of the pyramid to help reduce weight.

- Better understanding of when to be keen and climb up, and when to stay put and support people above.
- Ability to support additional weight on shoulders (coincides with increased strength values).
- Ability to beckon other frosh up (passing them a "message" encouraging them to do so).

3.2 Other Uses of IntelliFrosh in The Pole Game

The other animated sprites in *Legend of the Greasepole* are also implemented with *IntelliFrosh*.

3.2.1 The Crowd

The crowd of purpled Frecs is an example of another complicated behavioral system implemented with *IntelliFrosh*. There are three "sections" of crowd visible during the game. Each section keeps track of their internal characteristic *attrExcitement*, as well as several metrics that are used to determine how they react to the action around them. An example of one such metric is the number of frosh currently at each level of the human pyramid.

All other sprites in the game have access to a global "energy pump" that can be used to infuse the crowd with energy. The energy in the crowd slowly declines as a function of time, such that the only way to keep a crowd cheering is to continually pump energy into them. The resulting energy system is very dynamic, and heavily sensitive to feedback. For example, an increase in energy may induce the act of cheering, which in turn will cause an increase in the rate at which energy is released. Once sufficient energy has been released, the crowd ceases to cheer and returns to milling around.

The following constants describe the behaviors available to the crowd:

faMilling	Milling about and watching the action. Occurs when the crowd has minimal energy and there is no action in the greasepit.
faCheering	Cheering and waving their leather jackets. When the crowd energy level rises above the constant *energyCheer*, this action is triggered.
faSlamming	Cheering and slamming their leather jackets on the ground in unison. When the energy level rises above the constant *energySlam*, this action is triggered. Causes a massive release of energy.[7]
faBooing	Taunting the frosh.

Figure 10: Crowd milling, cheering and slamming jackets.

[7] Must be experienced first-hand for full appreciation (and perhaps even partial understanding).

	Occurs when energy level is above *energyCheer* and there are very few frosh above the first level of the pyramid.
faBlocking	Blocking an apple toss with their leather jackets. Occurs if the player throws an apple at the crowd. Detrimental to the player's attempt to obtain their iron ring, and saps energy from the crowd.
faShouting	Shouting at the frosh to encourage them. Occurs when energy level is above *energyCheer* and there are many frosh above the first level of the pyramid.
faLookUp	Looking up at the Tam. Will be triggered if *faMilling* is active and there is a frosh at the Tam.
faLookULR	Look up and to the right. Part of the "Golden Words Balloon" fly-by routine.
faLookURL	Look up and to the left. Part of the "Golden Words Balloon" fly-by routine.
faStayinAlive	Dance the moves appropriate for the disco song "Stayin' Alive." (Not active in v1.14.)
faWave	Do "the wave" with leather jackets. Triggered randomly and is passed through the crowd.
faPart	Parting to allow Al "Pop Boy" Burchell through.

3.2.2 The Menu and all other objects

Every other object in the game – even the menu bars and the mouse cursor – are controlled by behaviors implemented with *IntelliFrosh*. The following enumeration of the sprites in the game provides some context as to the abundance of sprites that have been implemented with *IntelliFrosh*.

Figure 11: Sample sprites using IntelliFrosh during gameplay. Obvious examples here are the player's hand (sprARM), Commerce student (sprCOMMIEF), EngSoc President with megaphone (sprPREZ), and the three sections of the crowd. The crowd is now exhibiting faWave.

3.2.2.1 Game Sprites

Over 35 sprites are available for the game to display during gameplay. Figure 11 displays an image showcasing a number of these sprites. The player's hand at the front of the screen is encapsulated in the *sprARM* sprite. The pop-up Arts and Commerce students (like the female Commerce student, *sprCOMMIEF*, shown here) are encapsulated in their own sprites as well. The president of the Engineering Society

(the guy standing on the podium at the left) is controlled by a set of *IntelliFrosh* behaviors running under the sprite *sprPREZ*. Of course, each frosh is controlled by an instance of *sprFROSH*. The crowd consists of three sprites: two instances of *sprFRECGROUP*, and one instance of *sprFRECACTION*.

3.2.2.2 Menu Sprites

The menu and transition screens are also displayed and controlled by a group of over 30 *IntelliFrosh* sprites. The "discipline selection" screen showcases how IntelliFrosh facilitated rapid development. Each of the discipline bars shown in figure 12 are instances of their own IntelliFrosh sprites, *sprmnuBAR1* through *sprmnuBAR20*. Each make use of the same *action* function, but they are initialized to their own sets of internal characteristics. The resulting sprites are able to cue up different wave files and return to unique locations on the screen, but are also each capable to being dragged onto the arm of the (purpled) leather jacket.

Figure 12: Menu items using IntelliFrosh. Samples shown here include the sprmnuBAR*nn* group and sprmnuMOUSECURSOR.

3.3 Other technical achievements in Legend's code

In addition to *IntelliFrosh*, the following tools and interfaces were developed for *Legend of the Greasepole*:

- ***GameLoop***, a Windows event-driven GameLoop class.
- ***Mouse,* a** mouse handling class.
- ***SpriteSet***, a container class that implemented parallax scrolling between layers of sprites.
- ***TSprite,*** the class which housed IntelliFrosh.
- ***Layer***, part of the layering system used for ***SpriteSet.***
- A *DirectX* wrapper interface.
- A system for managing bitmaps and wave files.
- Registry manipulation functions.
- The *AutoRun* utility which runs when the CD is placed in the drive. Also developed using Visual Studio and written in C++.
- Coding for the *InstallShield* installation that automates the *Pole Game's* installation onto an end-user's machine. Written using InstallShield Express 2 by InstallShield Software Corporation.

3.4 Artistic and Sonic Considerations

3.4.1 Live Recording of Graphics

The majority of the artwork found in the *Pole Game* was created by modifying digital images taken with a *Nikon Coolpix 300* at Greasepole '97. The resulting images of mud, lanolin, the pole, the podium and everything else at the pit site were doctored and edited before being included in *Legend of the Greasepole*.

The crowd is one exception; it was filmed with a camcorder prior to the actual Greasepole event. Images frozen from the camcorder stream were of significantly lower quality than the shots taken with the digital camera, but the fast-action shots of jackets being slammed could not be acquired using still-motion methods.

Over 30 individuals are listed as the visual cast of *Legend of the Greasepole*. There are countless others who attended the filming session and remained anonymous. A number of individuals – including Al "Pop Boy" Burchell – worked closely with the *Legend of the Greasepole* team to carefully digitize images like the player's hand and the player's jacket.

3.4.2 Hand-sketched Graphics

Elizabeth Burke of Sheridan College, a fine arts school in Toronto, Ontario, designed the look of the frosh character for *Legend of the Greasepole*. She took two months to sketch and animate the character, which she based on the stereotype of a "typical" first-year engineering student at Queen's University. The frosh each sport a tam, plaid pants, a purple "frosh week" T-shirt and the requisite socks-dangling-from-the-tam to complete the look. The frosh were first animated on paper performing actions that corresponded to those required for behaviors listed above. Once scanned into the computer, the frosh were colored in and touched up by Kitty Lee, an Applied Science student at Queen's.

It was important that the frosh appear unisex, and also reflect the multicultural nature of the Queen's student community. A great deal of work went into writing code that would take a single skin tone and map it onto several different tones for the game.

3.4.3 Rendered Graphics

Three elements of the artwork – the Iron Ring forge, the Iron Ring and the megaphone – were rendered using 3DStudio Max.

The Iron Ring Forge is Artistic Director Craig Calvert's creation and is rendered entirely in 3D, as is the spinning Iron Ring.

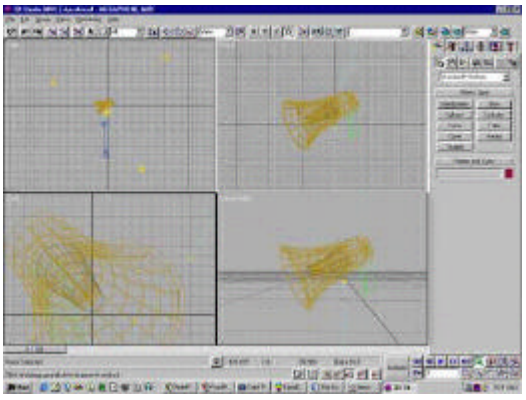
The megaphone represents one challenge that was overcome using high-tech methods. No megaphone available was during the digital filming at Greasepole '97. We wanted the Engineering Society President – at that time George Dyke, Applied Science class of '98 – to be able to speak through a megaphone at the frosh in the game. George ended up using a milk jug as a stand-in. The jug was replaced by a 3D-rendered megaphone for the shots included in the game.

3.4.4 On-Site Digital Audio Recording

The majority of the sound effects heard in the game were recorded on-site at Greasepole '96. A TASCAM digital audio recorder was used to record over 600 megabytes of high-quality sound effects were recorded at the event for use in the game.

3.4.5 Queen's CFRC Studios Audio Recording Session

On October 31st, 1997, a recording session was held at the digital studios of Queen's on-campus radio station, CFRC. At that time, the voiceovers that had not been obtained during frosh Week were digitally recorded. See the "Project Management" section below for more details.



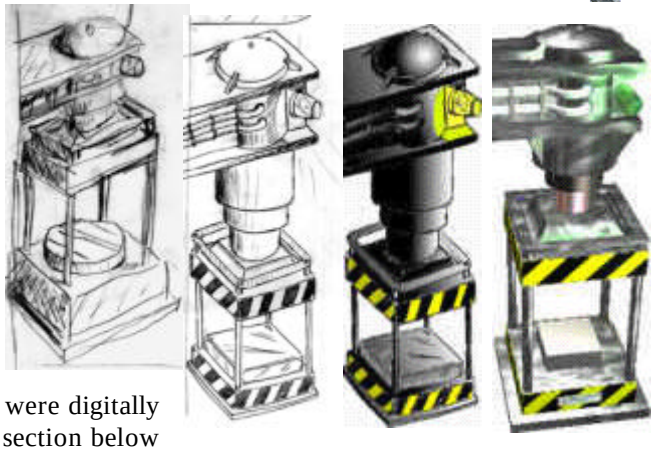


Figure 13: Engineering Society President and rendered megaphone; stages of development for Iron Ring Forge.

3.5 Relation to other recent work

Near the end of *IntelliFrosh's* development, its author came in contact with Dr Bruce Blumberg's thesis *Old Tricks, New Dogs: Ethology and Interactive Creatures.* Dr Blumberg, who leads the Synthetic Characters group at MIT's Media Lab, asserts in his thesis that ethology and classical animation are ideal sources of inspiration for interactive creatures. *IntelliFrosh* incorporates the five features that Dr Blumberg identifies as fundamental for producing authentic synthetic characters: *relevance, persistence & coherence, adaptation, intentionality,* and *integration of external control.*

Relevance is fundamental to the behavior-based system: the frosh weigh over a half-dozen internal variables each time they make a call as to how to appropriately proceed. Some are more "traditional" (hunger, curiosity) while others are more Greasepole-oriented (resilience, ability to sustain weight, fear of heights).

Persistence and coherence are achieved through altering the frosh mindset as the game progresses – as the Frosh grow tired and less interested in distractions, their ability to persist towards the long-term climbing goal increases. As a result, the system is able to reflect their increasing ability to exhibit persistence. Coherence is achieved through the use of a number of techniques, including limiting the times a change in behavior can occur. The game engine is kept running smoothly by staggering which frosh are making computationally intensive decisions during any AI cycle.

Despite their two-dimensional rendering, having over 100 unique graphics associated with the character allowed for considerable display of *motivational state and intentionality*. The frosh indicate to each other (and hence, the player) what they believe to be an "ideal human pyramid." They beckon their friends up, and look frustrated when too many people weigh down their shoulders.

Learning and adaptation occur continually. The frosh continue to learn from experience and from their friends. These effects are discussed above.

Finally, *integration of external control* is what makes the game a game. The player's role is to provide the frosh with alternatives to their primary goal of retrieving the tam from atop the pole. Whether the player is tossing a slice of pizza (good for eating) or an Arts student (good for splashing), the whole point is to play on the internal variables of the frosh and keep them distracted and having fun.

What is unique about this system is the veritable *mob* of artificially intelligent characters interacting in the virtual world. There are 85 frosh in version 1.14 of Legend – more than the author thought the computer would be able to handle at 23 Hz. Perhaps future technology will enable us to render the 570 Frosh typically tossed into the Pit each September!

4. Personal

4.1 Project Management and Timelining

While the technical challenges that presented themselves during the *Legend of the Greasepole* project were significant, equally challenging was effective project management. From December of 1996 through to the end of the project in August 1998, a massive Gantt Chart and timeline maintained by the author helped keep the project on track. A database was developed that kept track of over 50 goals that were to be achieved at specific times during the course of the project. The following properties of each goal were tracked:

Goal	General description of and motivation for the goal.
Category	Art, Music, Programming, Web Design, or Other.
Duration	The amount of time this goal would take to achieve.
Resources	The resources that would be required to accomplish this task.
Ending Milestone	A *very* specific milestone to mark the end of this task.
Dependencies	Other goals that needed to be met before this one.
Planned Completion Date	A specific date.
Promise Date	Date the Planned Completion Date was last updated.
Status	Current status of this goal.
Assigned to	Individual responsible for ensuring this goal is reached on time.

The database of goals was shared via the *Legend of the Greasepole* web site so that all members of the project team had access to the current status of the project. It was also updated regularly in its giant wall-sized form at *Legend of the Greasepole* Headquarters in Kingston (the author's basement).

With so many individuals involved in the project and so much to accomplish within the time frame, the team was very pleased to be completed the two-year project *ahead of schedule by four weeks.* The CDs were ready in early August, ahead of the September 12th, 1998 target.[8]

The team is indebted to Professor David Alex Lamb of Queen's University for the documents he provided that detail the planning of a large-scale software engineering project. Regrettably, the time line we developed is not available in Microsoft Project or other project management software and as such is not included with this document. The author regrets not taking pictures of the giant timeline when it was on the wall, as it was pretty cool.

4.2 Publicity

Because there had never been a Computer Science club at Queen's University before, and because no real channels existing for publicizing the new project, it was very difficult to promote *Legend of the Greasepole* and get individuals involved in its creation. Included with this document are samples of advertisements that were created during *Legend of the Greasepole*'s development.

[8] The day that Science 2002 climbed their Greasepole. Their climb was on schedule, too; they did the job in 112 minutes.

Our publicity campaign included the following highlights:

- *The Pole Game Compendium* was a document written by Robert Burke and officially released Friday August 2, 1996. It included: a project timeline; a description of *Legend of the Greasepole* and the artificial intelligence tasks that lay ahead; a discussion of potential "tools" that might be implemented as means for the player to stall the frosh; and a list of the sound effects we would need to record the following month during Orientation Week. The document was released on the Queen's Applied Science '99 Home Page and distributed around Kingston.
- During the summer of 1996, Robert Burke worked as Assistant to the Head of the Mathematics and Statistics department at Queen's University. He had been asked to arrange a reunion for all 50 years of Math and Engineering graduates at Queen's. At the time of the reunion, the first incarnation of IntelliFrosh was functional and the frosh characters in *Legend of the Greasepole* were capable of a feeble attempt at climbing the Pole. Robert demonstrated the game to the alumni at the reunion, and their response was very positive. Donald Bloor, Science '77, sent the *Legend of the Greasepole* team an unsolicited donation, with a request that the team reserve him a copy so that he could "indoctrinate [his] members of the classes of Sci '08, Sci '12 and Sci '15."
- The Halloween Recording Session at Queen's CFRC Studios of 1997 was heavily publicized.
- In March of 1998 a copy of Beta 1 was provided to Tom Harris, the current Dean of Engineering at Queen's. It was important to the *Legend of the Greasepole* team that the game met his high expectations for the ways in which the Applied Science program at Queen's is portrayed. We received his full support, and *Legend of the Greasepole*'s Artistic Director Craig Calvert was offered a job with the Faculty of Applied Science Office during the summer of 1998. (Robert Burke declined a similar offer, as he had already accepted an offer to work for a second year with Dr. H. E. A. Campbell, Head of Queen's Department of Mathematics and Statistics.)
- In early April of 1998, a campaign with the slogan *"Relive the Unexplainable"* was launched. Full-color glossy advertisements for the game were sent to over 250 alumni, as well as 200 high-tech firms.
- In late April of 1998, an advertisement was submitted to Golden Words, the campus Engineering publication. It reminded the students that the *Pole Game* was coming and would be at Queen's in September.

4.3 Legal Issues

To quote the LegendWeb (where "we" refers to the *Legend of the Greasepole* team), "From Day 1, The *Legend of the Greasepole* team has been committed to a purely legal production. We have purchased every piece of software used in the development of The Pole Game and The LegendWeb and encourage others to do the same.

"We have received written and/or verbal permission from each of the [listed] cast members for the use of their likenesses within the *Pole Game*. The characters being portrayed in the game are fictional, and while the Pole Climb is a real event, none of the events portrayed within *The Pole Game* actually occurred. The Male ArtSci, Female ArtSci, Male Commie and Female Commie characters were not filmed at the Greasepole and the effect of them falling into the pit was simulated.

"The *Legend of the Greasepole* designers are indebted to the many authors and contributors to the Queen's Engineering Society Web, found at **http://engsoc.queensu.ca**. The *Legend of the Greasepole*

team made every effort to contact the current webmasters and confirm that it was acceptable to use their material on the CD.

"No frosh were harmed in the production of this game."

4.4 Financial Issues

Due to the innovative (and outlandish) nature of the *Legend of the Greasepole* project, it was extremely difficult to find financial assistance for the project within the Queen's community. *The Legend of the Greasepole* has always been a non-profit endeavor, and if its developers sell the entire first run, they will just break even.

To quote the *LegendWeb* again, "the rentals of digital audio and video equipment, as well as *required* upgrades to our computer systems and burning of 1,000 CDs resulted in expenditures of over *$8,500*. (A more detailed breakdown of expenses is available upon request.) We have been exceedingly careful regarding copyright law (see above), and are proud to know that we have conducted business without pirating *any* software or intellectual property."

Financial support finally came during September of 1998 from the Alma Mater Society of Queen's University. Their Special Projects Fund donated over $2,000 to the *Legend of the Greasepole* team to assist with burning the CDs. The CDs have since been distributed within the Kingston community and are available to students for between $12 and $18.

The *Legend of the Greasepole* Team is also indebted to the following for their financial assistance and contributions:

Mr Donald Bloor, Sci '79

Peter Burke, Nikon Canada

Computer Depot of Kingston, Ontario

5. Involvement and Credits

Producer	**Robert Burke (Sci '99)**
Artistic Director	**Craig Calvert (Vancouver Film School '00)**
Frosh Character Design (paper)	Elizabeth Burke (Sheridan College '01)
Frosh Character Design (digital)	Kitty Lee (Sci '99)
Lead Programmer	**Robert Burke (Sci '99)**
Beta DirectX Engine	Pat Bouffard (Sci '99)
CFRC Studio Manager	**Tuan Vu Bui (Sci '99)**
Legends & Tradition Documentation	**McKay Savage (Sci '99)**
LegendWeb Editor-in-Chief	Robert Burke (Sci '99)
Legends Editing and Resources	Naomi Brunemeyer (Arts '99)
	Greg McKellar (Info. Officer, AMS)
	Nancy Reid (Sci '98)
	Queen's Archivists
Additional Documentation	Amy Langstaff (McGill Arts '01)
	Kirsten Sorenson (Sci '00)
	Gen Okita (Sci '99)
	Philippe Lavoie (Sci '99)
EngSoc Web Liaison	Jamie *ff*olliott (Sci '99)
Golden Words Advertising Contact	Zoë Carlin (Sci '00)
Clark Hall in the Sky (with diamonds)	John P. Joseph (Sci '97)
	Geoff Randall (Sci '98)
Assistant Programmers	Scott Webster (Sci '01)
	Mike Lawler (Sci '99)
Legal Wizard	Mary Wojtyk (Sci '00)
Media Consultant & Beta Testing	**Sean Snider (Arts '01)**
Windows NT Consultant	Jamie *ff*olliott (Sci '99)
Beta Tester	Sandy Snider (Arts '99)
Beta 2 CD-R Assistance	Jamie Brown (Queen's Dept. of Psychology)

CAST – VISUAL

Supportive Upper-Year	**Alan "Pop Boy" Burchell (Sci '99)**
The EngSoc President	**George Dyke (Sci '98)**
ArtScis	Adrienne LeVasseur (Arts '00)
	John Masterson (Arts '00)
Commies	Greg Coughlin (Comm '00)
	Karen Spelliscy (Comm '00)
SciCons	Brian Shickluna (Sci '99)
	Marie-Claire Gagne (Sci '99)
First-Aid	Linda Valenta (Arts '99)
Player's Jacket	Matt Smith (Sci '99)

Player's Hand	**Alan "Pop Boy" Burchell (Sci '99)**
Cheering Frecs	Kirsten Sorensen (Sci '00)
	Jean-Francois Ruta (Sci '00)
	Aaron Styles (Sci '00)
	Neil Bunn (Sci '00)
	Sharelene Plewman (Sci '00)
	Scott White (Sci '00)
	Ross Pearson (Sci '00)
	Colette Heald (Sci '00)
	Robin Fauquier (Sci '00)
	Wells Baker (Sci '00)
	Matt Dawson (Sci '00)
	Mike Dragery (Sci '00)
	Andrew Loschmann (Sci '00)
	Mark Scott (Sci '00)
	Christine "Smoker" Woodhouse (Sci '00)
	Jen Johnson (Sci '00)
	Colin Campbell (Sci '00)
	Todd Carmichael (Sci '00)
	Rich Hayward (Sci '00)
	...and a cast of thousands (including the Action Frecs of Sci '00.)

CAST – VOICE TALENT

Supportive Upper-Year	**Alan "Pop Boy" Burchell (Sci '99)**
The EngSoc President	**George Dyke (Sci '98)**
Computer	**Steph Melnyk (Sci '99)**
The Frosh	Derek Crawford (Sci '99)
	Kitty Lee (Sci '99)
	Brian Menzel (Sci '99)
Apple-Carrying Crowd Members	Mary Wojtyk (Sci '00)
	Rebecca Simpson (Arts '99)
Pizza Delivery Guy	Blake LaChance (Sci '99)
Keg-Carrying Crowd Member	Brian Menzel (Sci '99)
Keener with 114 Exam	Jason Silzer (Sci '99)
Person with Firehose	Duane Parliament (Sci '99)
ArtScis	Jen Johnson (Sci '00)
	John Masterson (Arts '00)
	Brendan Carroll (Sci '99)
Commies	Tara Ashworth (Sci '99)
	Kristi Giba (Sci '00)
	Brian Shikluna (Sci '99)
SciCons	Erica Lee (Sci '00)
Cheering Frecs	McKay Savage (Sci '99)
	Jenzy Thomas (Sci '99)
	Phillipe Lavoie (Sci '99)
	Kirsten Sorenson (Sci '00)
	Zoe Carlin (Sci '00)

SPECIAL THANKS

Peter Burke, Nikon Canada
for the Nikon CoolPix 300 Camera used during production,
and for his tremendous support.
Donald Bloor, Sci '78
for The Legend of the Greasepole's first financial contribution.
CFRC Studios, Queen's University
for use of their equipment and studio time.
The gang on Parliament Hill in Ottawa, Canada Day, 1996
who made us realize this was all possible.
Marg Kueper
for support, guidance and being an all-around awesome person.
Prof. David Alex Lamb
who cared, and helped keep us on track.
George Dyke
...he's the jam!
To anyone in the above cast who doesn't appear in the game
You were *all* awesome, and we used as much footage as we could.

6. Development Tools

The following tools were used to develop *Legend of the Greasepole*.

6.1 Programming and IntelliFrosh

Microsoft Visual Studio 5.0

Microsoft DirectX 3.0, 5.0, 5.2

InstallShield Express 2.01

6.2 Art and Graphics

6.2.1 Software

Adobe PhotoShop 4.0

CorelDRAW! 6.0, 7.0, 8.0

Corel PhotoPAINT 6.0, 7.0, 8.0

3DStudio MAX 1.1

6.2.2 Hardware

Nikon Coolpix 300 Digital Camera

Sony Camcorder (model unavailable)

6.3 Sound

6.3.1 Software

CoolEdit 96 (audio editing and effects software)

6.3.2 Hardware

TASCAM DA-P1 Digital Audio Tape Recorder

Sound Blaster AWE-32

6.4 Miscellaneous

Microsoft Access 97 (project management database)

Microsoft FrontPage 98 (LegendWeb design)

6.5 Production

CD-ROMs were produced by ROMifications of Ottawa, Ontario. The *Legend of the Greasepole* team received the first run of 1,000 CDs in Kingston on August 12th, 1998. The CD silkscreen, jewelcase liner and booklet were produced using four-color process from graphics originating in CorelDRAW 8.0.

7. Other Documentation

This is one of many reports written about *Legend of the Greasepole*. A variety of technical information about the game can be found in the *LegendWeb* on the *Legend of the Greasepole* CD. Current information and new releases of the game can be found online at http://engsoc.queensu.ca/polegame.

Burke, Robert C., The Legend of the Greasepole: Artificial Intelligence and Groupwork for Synthetic Characters, (September 1998). *8 slides from presentation given for MATH494 projects course; available upon request.*

Burke, Robert C., Legend of the Greasepole Application for Alma Mater Society Special Project Funding, (July 1998). *Presented to Alma Mater Society Vice President University Affairs Alison Loat; available upon request.*

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Burke, Robert C., The Pole Game Compendium, (September 1997). *Available at Gallery\Betas\Documents\ in LegendWeb.(Essentially the Pole Game Whitepaper v2.0)*

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8. Glossary (or, a Queen's Lingo Primer)

Applied Science	Synonym for engineering. The two are used interchangeably at Queen's.
ArtSci	An Arts and Science undergraduate student at Queen's.
Clark Hall Pub	The "watering hole" of choice for engineers at Queen's. Also referred to locally as the "Center of the Universe." The pub is located immediately above the bookstore and adjacent to the Engineering Society offices and lounge.
Commie	A Commerce undergraduate student at Queen's.
EngSoc	The Engineering Society. Their offices at Queen's are found in Clark Hall. (See "Clark Hall Pub.")
Frec	Queen's engineering orientation leader – these are the second-year students who welcome the new students to Queen's. They're typically sporting mohawk hairdos ("EngCuts") and gold leather jackets. The purple tone comes from being covered with *gentian violet* dye.
Frosh	First-year Queen's student (in the context of this document, typically a first-year Applied Science student).
Gentian Violet	A medical dye; active ingredient potassium permangenate ($KMnO_4$). Great for "purpling" jackets and bodies.
Golden Words	The humorous engineering newspaper published weekly at Queen's. Their masthead features a blimp, and their mascot is a black-and-white hippopotamus.
Greasepit	The location of the Greasepole event. A piece of farmland owned by the Engineering Society in a community adjacent to Kingston, Ontario. (The author knows exactly where, but has already revealed too much.)
Greasepole	See Section 1.1 of this document.
IntelliFrosh	The behavior-based artificial intelligence system that governs the behavior of the frosh and every other character in the *Pole Game.*
Iron Ring	Worn on the little finger of the working hand by Canadian engineers; symbolizes both the pride *and* humility of the profession. See the footnote on page 14 for more information.
Jacket Slamming	Taking your golden (or purpled) leather jacket and periodically slamming it on the ground to create an awesome sonic barrage. (Appropriate slamming frequency approximately 1.5 Hz.)
LegendWeb	The traditions of Queen's Applied Science, presented in 400 megabytes of multimedia on the *Legend of the Greasepole* CD.
Physics 114	"Trial by fire" first-year Engineering course. If you can make it through 114, you'll survive the program. The appropriate response to "How hard's 114, frosh?" is, *"Soooooooo Hard!"*
Pop Boy	First year Applied Science Vice President, whose responsibilities include filling the pop machine at the Engineering Society in Clark Hall. Six-foot-five local legend Alan "Pop Boy" Burchell was VP and of Science '99 from 1995-1996.
Purple	(verb) To cover with Gentian Violet medical dye (see "Gentian Violet" above).
Purpling	The act of covering an object or body with Gentian Violet medical dye.
Sci	Short for "Science"
SciCon	Science Constables; the student regulation force on campus.
Science	Short for "Applied Science" (see "Applied Science" above).
Tri-Pub-Ban	The greatest punishment a Science Constable can administer. A Tri Pub Ban prohibits you from visiting Clark Hall Pub, Alfie's Pub or the Queen's Pub for the remainder of the academic year.