Narrative In Robotic Scenarios For Art Works

Daniel A. Bisig

Senior Research Assistant
Artificial Intelligence Laboratory
University of Zurich
Andreasstrasse 15
CH-8050 Zürich
Switzerland
dbisig@ifi.unizh.ch

Adrianne Wortzel

Professor, Entertainment Technology
And Emerging Media Technologies
New York City College of Technology
City University of New York
300 Jay Street, Room 1113
Brooklyn, New York 11201
awortzel@citytech.cuny.edu

Abstract

This paper discusses narrative as a sub-field of creative robotics. We make the premise that every robotic system (regardless of the original intention of it's engineers) is layered with context and meaning both in itself, and in its process of coming into being. Through artistic observation and interpretation these layers can be made tangible as scenarios for art works manifested in art forms such as literature, film, installation and live performance. As a case study, we present an ongoing project entitled "archipelago.ch" which works solely with scientific robotic platforms developed at the Artificial Intelligence Laboratory of the Department of Informatics, University of Zurich, Switzerland (the "AILab"). By working with existing robotic systems originated in the AILab we move away from sculptural or choreographic concerns to develop a dramatic scenario, which is true to capabilities of a particular robot or robotic system. We argue that such scenarios are both an effective form of art expression and that they also have the potential to re-enter and inform the science from which they emerge.

1 Introduction

There have been two familiar approaches in narrative, which emulate how the spark of life can begin in a machine. One is the scenario of a thing becoming more than the sum of its parts. This can be found in Mary Shelley's Frankenstein when Victor Frankenstein finds credence in the fact that assembling human body parts and subjecting the result to electricity will render the thing "alive".

The other approach is where an entity with powers beyond those of a human is required for rescue or remediation; i.e., where there is a task to be done and the machine is designed and executed to fulfill the goal of that task. The robot then becomes characterized as a "device", whether it lives in an industrial assembly line of a manufacturer or in a theatrical work such as the deus ex machina in Euripides, or as the ilk of the robots in Karel Capek's R.U.R.

One could even construe the use of the "other" in Shakespeare, as a dramaturgical device that could be characterized as "robotic" because its behavior and motivations serve the story of the play.

Practically speaking, since the earliest art robotic installations produced by such artists as Nicolas Schöffer [Schöffer, Nicolas. Nicolas Schöffer (Neuchatel: Editions du Griffon, 1963), p. 50.], artists have been experimenting with robots. In most artworks, artists have either adapted existing robots or developed entirely novel robots in order to fit them into a particular artistic concept. In the latter instance, the robots play the role of actors and therefore must adapt to a strictly choreographed scenario and take on a particular role and characteristics, which serves the narration. These adaptations quite often hide the specifics of the robots and in case of robots which have been developed by scientists or engineers leads to an obliteration of their original intents.

We will describe a form of artistic engagement with robots which has hardly been explored: an empirical form of developing robotic narratives where an artist takes on the role of an observer, a partner in ideas, and an interpreter of robotic research and where the development of the narrative becomes an exploratory and experimental process for the artist that runs in parallel to the researchers. To a certain degree the artists gives up authorship by openly taking into account the robot's peculiarities and respecting its (partial) autonomy. We believe that such an approach could lead to novel forms of narrative which move away from stereotyped interpretations and utilizations, and instead serve to amplify robots as particularly interesting creatures possessing inherent potential for meaning and expression emerging from the research process which led to its creation. With this methodology, a robot can surpass a human actor because it is no longer emulating a human but rather expressing its own "nature." The robot also surpasses simple machines in its potential for narrative because it depends less on arbitrary projections from the human audience or inter-actors for its effectiveness in telling a story.

1.1   Our Motivation

1.1.1. Robotics and Narration

Robots lend themselves to narration as archetypical beings that question our understanding of living things while constantly reminding us of the delicate balance between our control and their autonomy. Their entirely alien nature gives rise to a vast variety of mystifications, interpretations and anthropomorphizations. The ample territories of fiction and fact made available there allows artists collaborating with researchers the creative movement between didactic, spiritual, philosophical and artistic concerns required for effective expression.

1.1.2. Public Perception of Robots

One of the authors herewith (Adrianne Wortzel) has been creating interactive robotic art installations and performance productions for the past ten years. One aspect that emerges during the tenure of these works is the persistence with which humans enjoy interacting with robotic simulations of presence as if the robot is cognizant. This occurs even when it is obvious that the robot is a machine following procedural instructions without an iota of artificial intelligence. In these instances, the public's reactions to robots reflect a large discrepancy between their perception of robots and the actual capabilities of those robots. This results in the stereotyping and demonization of robots - imprinting on these artificial beings the role of service to humans as the "other" - seen as a threat such as a cold tool which is superior in domains such as in military and economic decision-making processes and their implementation.

These stereotyped views are so persistent that they have become redundant and curtail the wide variety of possible artistic and scientific explorations of robotics. And so, by merging an engineer's awareness of a robot's capabilities with an artists' expertise in creating imaginative narrative where that narrative adheres to the true nature of the robotic research at hand, we hope to broaden the public perception of robots.

1.1.3. Robotic Science and Robotic Art

For an overview of seminal robotic artworks the reader is referred to a paper by Eduardo Kac [Art Journal, Vol. 56, N. 3, Digital Reflections: The Dialogue of Art and Technology, Special issue on Electronic Art, Johanna Drucker, (ed.), CAA, NY, 1997, pp. 60-67.].

Artistic endeavors and scientific research can and should inform each other. Such exchange can only function effecitvely if both scientists and artist maintain a delicate balance: each keeping a critical distance to each other's positions, while at the same time, each immersing themselves in the other's process. In this way it is possible to circumvent the common pitfalls in art and science collaborations such as the relegation of artists to function only as public relations or educational communicators for the researchers, or, on the other hand, the researchers functioning only as technicians to serve the art. Instead, the goal would be to truly conduct independent and complementary forms of analysis.

The development of robotic narratives also fills a void which is felt by engineers and scientists who try to stay away from interpretation and speculation. This void can be filled by artists in a variety of interesting ways which may ultimately help to define the relationship between robots and society through experimentation with robots in novel (non laboratory) environments, juxtaposition

of natural and artificial traits, or exploration of interactions between humans and robots.

2. archipelago.ch

2.1. Artist-In-Labs Residency

The project started in July 2004 during a five-month residency of artist Adrianne Wortzel at the AILab. This residency was part of a larger "Artists-In-Labs" residency program initiated by Jill Scott of the University of Art and Design in Zürich The artist's goal of this particular residency was to develop a dramatic scenario for robotic entities created at the AILab. Early on it was decided that each scenario should be adapted to its robotic actor in such a way that it not only depicts the peculiarities of the robot but also reflects the research interests and working methodologies of the participating researchers.

2.2.. The AILab Focus

The main research focus of the AILab is to build robotic systems in order to study the interrelationship between morphology, cognitive capabilities, and environment in generating behavior. For example, current developments there include the embodiment of morphologies such as an insect eye learning to measure distance via reactive behavior to light, a humanoid hand developing identification methodologies for identifying grasped objects, a "mouse" capable of perceiving its environment by relying on whiskers as a sensory modality, aquatic creatures moving only through stimulated oscillation, four-legged running creatures, and more.
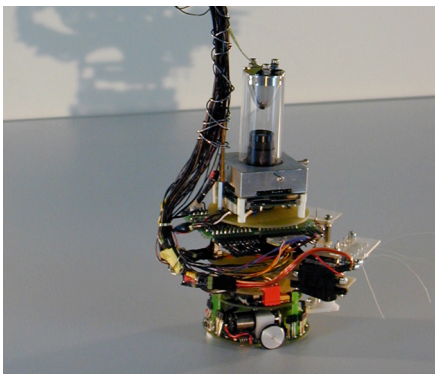
Artificial Mouse with Sensor Whiskers,
Researchers: Dr. Miriam Fend, Dr. Simon Bovet,
Artificial Intelligence Laboratory,
Director, Dr. Rolf Pfeiffer

The research at the AILab consists of separate projects with little more than just conceptual overlap. The series of labs with idiosyncratic entities being developed was transformed into a geographical territory of dispersed islands on which each robotic species evolves in isolation.
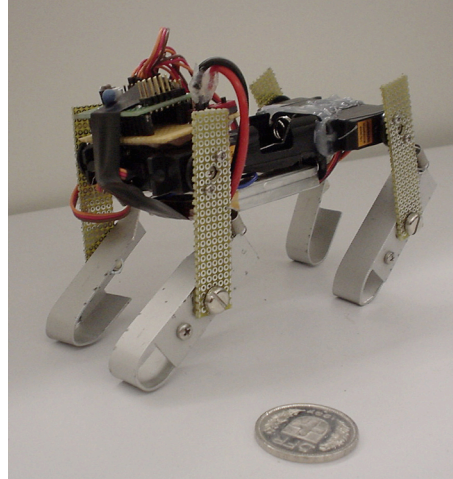

Minidog, Researcher, Dr. Fumiya Iida,
Artificial Intelligence Laboratory, Director:
Dr. Rolf Pfeiffer

2.3 Narrative Development

This holistic approach inspired the artist to evoke the role of Charles Darwin, a 19[t-]century naturalist attempting to observe and understand, in an entirely empirical way, the appearance and behavior of robotic creatures in the context of their bodily adaptations to a particular ecological niche. The artist then "rewrote" Darwin's Chapter 17 on the Galapagos in the "Voyage of the Beagle" as a narrative context for the scenario for the AILab substituting each of Darwin's discoveries of creatures with a creature from the robot and naming each "island" after the researcher responsible for the evolution of that particular robot.

Filming of the robots aimed at the production of a wide diversity of video material to emphasize the fact that robotic content is very open towards their emergence into roles and characteristics which are inherently present in them.

Material taken from a robot's perspective favors the perception of the robot as an independent subject.
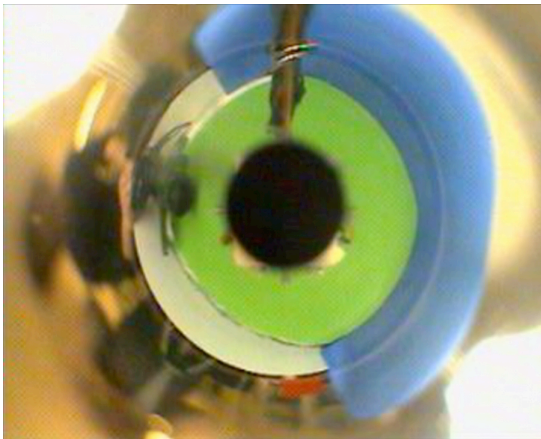
Panoramic Image from the Camera of the AMouse Robot. Researchers: Miriam Fend and Simon Bovet. The robot learns correlations between camera and whisker based sensory data.

Placing a robot in front of uniformly colored backgrounds creates a staged situation which emphasizes the robot's iconic characteristics.
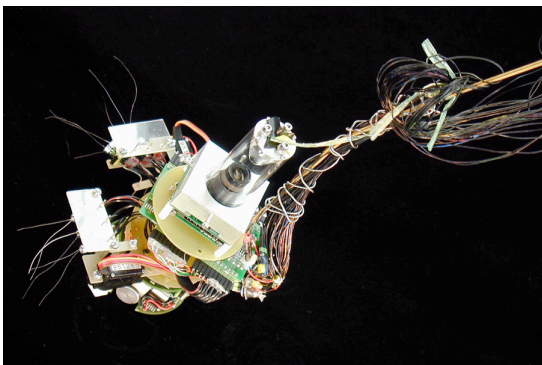
Amouse on the Set, whisker mechanism, Researchers: Dr. Miriam Fend, Dr. Simon Bovet

3. Initial Conclusions

3.1. AILab Researchers and the AIL Residency

Despite the fact, that the archipelago.ch project is still in progress at the time of this writing, we would like to draw some initial conclusions.

So far, the reactions both from peers, both scientists and artists, to the cinematographic output of this residency have been very positive. While the feedback was uniformly positive the interpretations and impressions of the robots behavior and characteristics were highly individualistic. This non-representative sample of people indicates that our short film promotes a versatile and non-stereotyped perception of the AILab's robots.

The depiction of isolated robotic parts puts the robot back into the position of a specimen existing only for the sake of experimentation.
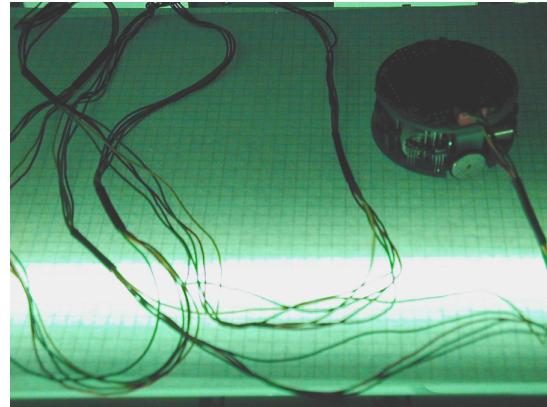
Amouse "ancestor"

In accordance with the AILab's scientific engineering principle which is subsumed under the term of "design for emergence", we put great emphasis on open evolution of the robotic narratives. The artist's exploration of the behavioral repertoire of the robot constantly fed back into the process of storyboard generation. Another strategy we employed in order to minimize the artist's (or scientist's) preconceptions consisted in the occasional reassignment of the participants' roles during filming. For example, shooting was done either by the artist, the scientists or the robot itself (by taking video material from an autonomous robot's own camera). Furthermore, the role of acting was also reassigned by letting the robot operate either autonomously or subject it to remote control by the artist or scientists.

Throughout the entire residency the artist's decisions and drafts were communicated to the researchers. This constant exchange of information proved to be beneficial not only for the development of the narrative but also for the scientist's own research. For instance, the metaphorical depiction of the AILab as an archipelago of dispersed islands provoked a lively discussion among the researchers themselves on the topic of sharing research ideas and practical skills in between projects. Another example involves an experiment conducted by an artistic collaborator on the project, Reto Inäbnit, who transformed the sensory data from the whiskers of the AMouse robot into an audible spectral range and thereby initiated new scientific experiments in data analysis.

We also feel encouraged by the fact that the establishment of an informal feedback loop between the artist and the scientists had a conceptual and practical impact on the AILab as dedscribed above. We attribute this success at least in part to our methodology of developing a robotic narration. In addition, some scientists stated that they intend to casually take on an "artistic" position in order to embed their robotic developments into a narrative that helps them explicate their work both for themeselves, peers and the public at large.

On the other hand it is also clear that the short duration of this residency was hardly sufficient to develop a finalized version of the robotic narrative as we intend it. Our approach is clearly a costly one that requires a large amount of time for the work and for collaborative communication in order to develop an appreciation for a robot's capabilities. This appreciation requires a mutual understanding of both artist and scientists for each other's methodology and interests. This understanding is particularly hard to obtain if the scientists are not able to dedicate some of their work hours to discussions and feedback. At the same time this approach requires from the artist some reconsideration of what creative work actually involves both in terms of content and collaboration. The actual writing of the narrative is significantly shifted towards to the end of a project in order to favor a long period of observation and re-observation of the robots behavior.

There has been encouraging exchange between the artist and the scientists that supports our point that this form of open narration indeed feeds back and forth between the artists and scientists and this has encouraged us to continue our project, archipelago.ch, despite the fact that the residency has ended. The communication channels between the artist and the scientists remain established and have the support of the AILab's Director, Dr. Rolf Pfeifer, for us to continue to conduct this experimentation in robotic narration with more robots and a longer timeframe.

3.2. Broad View

Inventions of our own making have allowed us to physically remove ourselves far enough away from our planet so that we can turn and set our gaze on it as the real object in space it is.-perspective that had been only imagined for millennia is suddenly empirical.

Concepts of moving around, and our roles as explorers, or other types of agents are forever changed with the development of new surveillance and tracking modes. Whether we use ourselves, or extensions of ourselves in the form of software, hardware or biological robots, to interact with places, people and things- i.e., to be situated in scenarios, the model of perceiving ourselves and being perceived has also expanded to points of view that were previously inaccessible to us. In thinking about "robots" and their relationship to narrative, we seek a new type of "presence" for artificial beings – taking our cues from a platform of empiricism--- the researchers' developments in robotic form----and amplifying it in situated environments of our own imaginations.