# Printing Fictions
## for my undergrad students: this assignment is due 12 May
## grad students: 11 May (that's a Monday)

*"The best way to understand how a text works is to change it: to play around with it, to intervene in it in some way (large or small), and then to try to account for the exact effect of what you have done."*

*~Rob Pope, Textual Interventions*


In "Making and Playing with Models," Bill Turkel and Devon Elliott explore the history of stage magic by creating working models of nineteenth-century physical apparatuses for levitation and vanishing tricks. Using commercially available toys and miniatures, as well as Arduinos and 3D-printed parts, they convincingly reconstruct historical illusions while at the same time subverting the racist and gendered stereotypes that were often part of these performances.

Taking a cue from Turkel and Elliott, this assignment asks you to make an argument about Philip K. Dick's ""Pay for the Printer" not with words, but things--specifically 3D printed things. You'll roll your own versions of the deformed artifacts, tools, and objects described in Dick's post-apocalyptic world and display them in a diorama, combining them with any other figures, items, or terrain elements of your choosing. The diorama might represent a scene within the story, or it might take the form of an alternative ending, an epilogue, a cut scene, or other new material that--like fan fiction--is based on the characters, plot, settings, and events of the original.

There are three parts to the assignment:
1.) A spreadsheet of 3D-printing errors.
2.) A diorama.
3.) An artist's statement

**The Spreadsheet**: **A taxonomy of 3D-printing errors**. While there is a dedicated Flickr Group lovingly devoted to the topic of 3D printing glitches, not to mention websites and YouTube videos galore that showcase them, there is—to the best of my knowledge—no effort to systematically document and classify them. The first part of the assignment, then, asks you to collect information about the known sources and causes of these mistakes, which will be publicly crowdsourced in a Google spreadsheet that I've

seeded in advance with a couple of examples. The bottom of a 3D print might flap upwards, for instance, if the floor of the platform is too cold; or your filament might get spit out if the extruder is too hot; or you might end up with a giant ball of plastic spaghetti if the extruder is too close to the printer bed.

Each group will be required to contribute **five entries** to the spreadsheet. For each row, you'll supply values for six fields: 1.) your group name; 2.) one or more 3D printers (make and model) associated with the error; 3.) a description of the error; 4.) the cause of it; 5.) an image of it; 6.) the source for information about it. Up to two of your entries may serve to confirm already documented errors in the spreadsheet. These confirmations may take one of two forms: documentation of your team's own successful reproduction of the error; or documentation of another independent source of information about the error. *At least one of the 3D-printed models in your diorama should reproduce or be inspired by a printing mistake found in the spreadsheet.*

In addition to contributing entries to the spreadsheet, your group will make a copy of it and then organize, group, or classify the errors into a meaningful system. We'll discuss this more in class.

**The Diorama**. There are many types of revision with which you can experiment in your remake. In general your goal in adapting the text to a new medium is to discover the sweet spot between staying true to the original and artfully deviating from it. Here are a few ideas borrowed from Rob Pope (quoted verbatim in the bullet points). When considering them, keep in mind that Pope has textual interventions in mind, while your interventions are primarily non-textual in nature.

- Changed opening. Cue the reader for a slightly or very different reading experience--one with different expectations as to genre, center of interest, tone, register, or meaning.
- Alternative endings. Alter the ending of the initial text so as to draw attention to some option that is latent, unexplored, or foreclosed in the base text in some way.
- Preludes, interludes, or postludes. Extend the text before, during, or after the events it represents so as to explore alternative points of departure, processes of development, and points of arrival.
- Narrative intervention. Change some turning point in the story so as to explore some alternative course of action.

Here are some additional technical, conceptual, and stylistic issues to think about:

- **The source of your distortions**. Given the hybrid physical-digital nature of your project, consider at what stage(s) in the design cycle you want to introduce distortions. The two proofs of concept I showed in class, for example, started with a generic 3D digital model I found on [3D Warehouse](#) and then modified using a warping plug-in for [SketchUp](#), a popular modeling software program. Alternatively, I might have started with a physical model that I broke or disfigured in some way, and then 3D-scanned for further processing before printing. I could also introduce distortions through finishing techniques, such as painting, or by experimenting with different printer settings that control variables such as temperature and speed. As you plan your project, think about where in the design pipeline it makes sense for you to purposefully generate deformations and how you want to combine and distribute them across your physical-digital practice.  For the purposes of this assignment, at least one of your distortions should be inspired by the ["Taxonomy of Printing Errors" spreadsheet](#).
- **The type of modeling software you use**. You'll want to choose a 3D modeling program that is compatible with your overall design argument. For example, the deformed drinking glasses I created were built using SketchUp, a popular solid modeling program that uses simple primitive shapes like cylinders, pyramids, and cubes to define more complex shapes. In my case, I was trying to capture the drinking glasses in a state of arrested decay, suspended between a goblet and a formless pudding, with individual parts still discernible. Conversely, if your goal is to elevate the status of Biltong prints, thereby inverting the story's overall value system, you might consider using a so-called "sculpting modeling program," such as [Sculptris](#), which starts with a sphere that can be tugged, pulled, squashed, and otherwise puddinged. The larger point here is that your choices of tools, materials, and techniques are central to your argument, not extraneous to it.
- **The slippage between Dick's fictional concept of 3D printing and the current state of the technology in the year 2015**. Most popular consumer-grade 3D printers on the market use plastic filament of some kind (some of it environmentally friendly, some of it not), while Dick's printers presumably use an organic compound produced from the Biltong's own bodies (not necessarily biodegradable). These material differences are expressed at the level of printing errors. Although some real-life glitches do result in blobs, bad print jobs in general take a variety of strange forms, as documented in your spreadsheets. Be alert to these differences and give some thought as to how they might figure into your remake.
- **A biography of things**. When conceptualizing your remake, try to imagine the lifecycle of Biltong prints: their genesis, production, functions, affordances, and

transformations. From a production standpoint, for example, what labor issues does the story dramatize? Are the manufacturing practices ethical? If puddinged objects lack distinct shapes and parts, what are the consequences for use, repair, disposal, and recycling? How do they compare to the lifecycle of things in our own world?

**The Artist's Statement.**
The artist's statement should be 4-5 double-spaced pages long (Times New Roman 12-pt font; 1" margins on all four sides). It should include the following information:

· A project title
· An explanation of your intervention into Philip K. Dick's "Pay for the Printer." Conceptually, your statement should explain the big idea or argument that lies behind your diorama.  You might also think about the tonal qualities of your project: is it intended to be humorous? Poignant? Parodic? Are you exercising a dark imagination, or approaching your subject comically or in some other vein?
· An account of your project's relationship to "Pay for the Printer." How did you strike a balance between anchoring your work in the short story while also artfully deviating from it? What did you want to honor in the original and what did you want to subvert, amplify, undo, or alter?
· A short narrative or account of the thought processes that led you to your idea.
· The design techniques and methods you incorporated to realize your idea(s). What tools or software programs did you use? How did you approach glitching and deformation? How did you make use of the 3D printing errors spreadsheet? What kinds of post-production finishing techniques did you use (e.g., paint? clay?)? What other materials did you assemble for the diorama?  What challenges did you face and (hopefully) overcome?

**Readings, Links, Software, and Other Resources**

- [Makerspace Desktop software](#) (free download)
- [McKeldin Library Makerspace](#) (where you'll do your 3D printing)
- [Makerspace Reservation form](#) (complete this form to reserve time on the 3D printers; remember that until you're fully credentialed, you need to book a time M-F 8:00-5:00 pm when Preston and Sandra can assist you).

- [Lynda.com](#) (an educational site for acquiring software, creative, and business skills. Includes video tutorials on 3D printing. Log-in for free using your UMD credentials).

*Software Modeling Programs*
- [Autodesk Inventor for Students: Free](#)
- [Tinkercad](#)
- [Sketch-Up](#) (Sketch-Up Make is free to download; Sketch-Up Pro is not)
- [Sculptris](#) (free download)
- [TGi3D Amorph](#) (download the 30-day trial, which is more powerful than the training edition)

Dick, Philip K. "Pay for the Printer." The Preserving Machine. New York: Ace Books, 1969.

Pope, Rob. *Textual Intervention: Critical and Creative Strategies for Literary Studies.* London ; New York: Routledge, 1994. Print.

Sayers, J., Elliott, D., Kraus, K., Nowviskie, B., Turkel, W. (forthcoming 2015). "Physical Computing, Desktop Fabrication, and Makerspaces in the Humanities." In Susan Schreibman, Ray Siemens, and John Unsworth (Eds.) A New Companion to Digital Humanities. Oxford: Blackwell.

Turkel, William, and Devon Elliott. "Making and Playing with Models: Using Rapid Prototyping to Explore the History and Technology of Stage Magic". Pastplay. 2014.
[http://quod.lib.umich.edu/d/dh/12544152.0001.001/1:6/--pastplay-teaching-and-learning-history-with-technology?g=dculture;rgn=div1;view=fulltext;xc=1](http://quod.lib.umich.edu/d/dh/12544152.0001.001/1:6/--pastplay-teaching-and-learning-history-with-technology?g=dculture;rgn=div1;view=fulltext;xc=1)