1. Introduction
The sketch focuses on the advances made in the process of casting crowd members on Shrek the Third, how and why it is different from procedural and rule-based casting on previous Shrek movies.

Historically we have relied on the random generation of geometry and material choices from a given pool for creating a crowd character. For example, on Shrek the Third, a typical woman crowd character has a geometry choice of 9 body types, 12 heads, 9 skirts, 9 bodices, 3 shoes, 8 hats, 7 hair styles, etc. When the character is in a shot, she may be composed of any combination of the above geometry group. Similarly on the material side, it can be any combination of the approved fabrics, colors and patterns as allowed by the shader trees.

We controlled the resulting combinations by building logic into our shader networks and deriving a set of higher order rules. But the shader trees and the rules often got extremely complicated in order to satisfy the many art director requests. As productions evolved, it became very hard to add to or modify these networks and rules.

In spite of the complex rules governing combinations, we often ended up with visually unpleasant crowd characters, and lighters would have to modify them individually to make them acceptable. This resulted in a lot of wasted artist time and render hours. We wanted to find a better mechanism for culling out such characters before they appeared in shots. We also wanted to give the art director a better visual reference when casting these characters.

2. The Catalog Approach
On Shrek the Third, we decided on a catalog system where we could pre-screen our possible crowd actors and cast the crowd only from that pool of actors. The biggest design challenge was incorporating the system into our modular workflow while maintaining scalability for use in hundreds of shots. At the same time, it was important to keep the interface simple and intuitive for the artists.

The geometry variations are built interactively by Layout. The approved variants are sent over to Surfacing where using the pre-built material shader trees, a specified number of combinations per variant are generated. During a culling session the art director marks the unpleasant crowd members for removal, and the rest are published into the catalog from which the crowd system would cast.

At the time of publishing we attach appropriate keywords to the members that are used later at the time of casting. Some example keywords are hat type, skirt type, outfit color, fabric, skin tone and crowd category (eg. villain, towns person, mourner, teenager).

3. Casting from the Catalog
We wrote a catalog viewer with search and display capabilities based on the keywords. For non-crowd characters, layout artists would work with the art director to interactively choose actors for shots. If it is for a crowd, our crowd system would perform the selection using the keywords. Additionally we would apply appropriate distribution rules to control the overall look of the crowd actors in the scene. We still maintained the ability to overrule any of these casting choices at lighting time so the artist could alter them per shot if needed.

4. Conclusion
A catalog serves as a great visual reference for selecting the generic characters and it provides us with a lot more control over the art directed, random nature of crowd casting. Given that the artists could still edit all geometry and material attributes in their shots, the catalog method did not take away any of the features they were used to.