**Paper:** Zhou, Xiang Sean, Yong Rui, and Thomas S. Huang. "Water-Filling: a novel way for image structural feature extraction." *Image Processing*, 1999. ICIP 99. Proceedings. 1999 International Conference on. Vol. 2. IEEE, 1999.

**Summary:** The method examined in this paper involves the application of a flood-fill algorithm to the edge map of an image, allowing a system to quickly determine the length and linkage of edges therein. Detection of edge pixels is performed using any reasonable algorithm, likely the Canny edge detector or similar methods; afterwards, a breadth-first flood-fill is applied to the generated edge map. This method tracks three key variables: the total fill time, the total “water” used, and the number of forks in each edge. These variables can then be translated into approximate edge length, size, and complexity, respectively. Zhou et. al. proceed to demonstrate the effectiveness of the algorithm in relevant-image detection, showing a marked improvement over texture-only analysis.

**Applicability:** While some Pokémon types are heavily weighted towards certain colors or shapes (eg., Water-type Pokémon are frequently blue), others will require more complex features to identify. By using the length and complexity of edges as an element in a Pokémon’s feature vector, it may become possible to identify types such as Dragon, which vary in color but share a jagged appearance.

**Issues:** As noted with object-based feature selection, the variable number of edges in an image may cause difficulties, as feature vectors need to be the same length to be compared in a given dimensionality. Possible remedies to this issue could include only comparing the most significant edge (a property that the Water-Fill method provides) or taking an average across all edges in each image.