This paper provides describes algorithms for discerning keys in a musical piece. As a basis for these methods, the author looks at work done by Krumhansl-Schmuckler in attempt to improve upon methods with a slightly different approach with respect to key profiles, the segmentation of musical pieces, and modulation. Furthermore, Temperley tests his algorithms against various proposed methods and also a standard music theory text in order to show its effectiveness. The algorithm would break up a piece in many logical equal segments and each segment is assigned a key. As the algorithm progresses if along the way, it determines that the prior key was incorrectly assigned based the present data, it can change that key.

Initially the author describes some features of the Krumhansl algorithm that could be improved upon or expanded. Basically he was trying to tweak the individual parameters to improve performance. One difference he suggested was a simplification of the key-profile values. Rather than using the normalized correlation, he suggested the use of simply a sum of the product scalar values. Moreover, noticing that the Longuet-Higgins model correctly determined keys properly in certain instances when the K-S model could not, he proposed a hybrid flat-input/weighted key approach. Thus, the input vector was not weighted and merely took into account the number of times a certain pitch occurred.

Next the area of modulation was examined. Temperley provided an interesting discussion on how many musical pieces not only contain one main key but also several secondary keys, which the K-S method did not account for. Their method just looked at the key of a piece as a whole rather than breaking up parts of the piece and looking at them as a whole. He also added the parameter called penalty, where a change in assignment of key would incur a penalty. In addition, he provides a ‘preference rule system’ where the assignment of keys is not based on the present segment but also all previous segments that were processed. Thus, this allows for backtracking based on new data that is being processed.

Finally, he compared the results of the algorithm with a standard music theory text. The author did find that his algorithm did not completely assign keys in the textbook correctly and offered some insight as to why. For example, the algorithm is better suited for more diatonic passages and some of the sections of the book reflected this. Also the modulation parameter was a difficult one to determine, sometimes the algorithm changed assignments too quickly or not fast enough.

I felt that this paper had some significant issues that were lacking in the K-S paper. What was interesting was how difficult it was to assign the keys and how that reflected the enormous complexity of how humans have the ability to determine keys. Ultimately there were too many variables and parameters that needed to be taken into account for which makes solving this problem a formidable one. I enjoyed this one much better that the Krumhansl paper. Temperley wasn’t as dry.