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**Kevin Seo\***, CRG-NJ, Cresskill, NJ , and **Richard Kyung**, CRG-NJ, Cresskill, NJ. *Study on Bioimaging Using Mathematical Transformation and Digital Image Processing.*

The original MRI image of a brain with a tumor showing pseudo-progression and Alzheimer's was analyzed with the linear algebra based transformation method. This method was performed by adjusting the contrast by a specific factor. The structures inside the brain and the tumor are easily distinguished and identifiable using the presented method. In comparison to using linear transformation, quadratic transformation allowed for us to observe the bright regions becoming brighter and the dark regions becoming darker. As a result, an image of high contrast was present; this is desirable when attempting to view tumors and small structures. Although the quadratic transformation factor is significantly less than the linear transformation factor for the MRI images, the tumor analyzed in the quadratic transformation showed more of a contrast against the rest of the brain than the tumor analyzed in the linear transformation. When the factors are too small, certain regions are significantly brighter than others. This not only renders the image but also is ineffective for observations, for a balance between overly-bright areas and detectable structures is ideal. (Received August 31, 2020)