1145-68-30 **Nektarios A Valous*** (nek.valous@nct-heidelberg.de), Im Neuenheimer Feld 460, 69120 Heidelberg, BW, Germany, **Rodrigo Rojas Moraleda** (rodrigo.moraleda@nct-heidelberg.de), Im Neuenheimer Feld 460, 69120 Heidelberg, BW, Germany, **Neha Pandey** (joonie2612@gmail.com), Im Neuenheimer Feld 205, 69120 Heidelberg, BW, Germany, **Dirk Jaeger** (dirk.jaeger@nct-heidelberg.de), Im Neuenheimer Feld 460, 69120 Heidelberg, BW, Germany, **Inka Zoernig** (inka.zoernig@nct-heidelberg.de), Im Neuenheimer Feld 460, 69120 Heidelberg, BW, Germany, and **Niels Halama** (niels.halama@med.uni-heidelberg.de), Im Neuenheimer Feld 460, 69120 Heidelberg, BW, Germany. *Visualization and separation of chromatic information in natural and medical images based on a quaternion algebra framework.*

Colors can be represented by vectors constructed by a linear combination of three primaries; in the perceptually nonuniform RGB color space the basic element i is chosen to describe red, j green, and k blue. Consequently, color pixels can be encoded by a linear combination of the three basis vectors in a hypercomplex algebra framework, e.g. quaternions. This encoding provides the opportunity to process color images in a geometric way, hence the quaternionic representation of color allows image analysis to be performed in a coherent manner. By conveniently rewriting the quaternionic representation of natural and medical images with simple algebraic operations, it is feasible to decompose an image into different spectral representations that can visualize and separate the contextual chromatic information. This pixel-based approach is computationally efficient thus taking advantage of parallel architectures in computing systems. The benefits of the proposed approach for medical images can be translated in two components: i) as a means for optimized manual assessment by clinicians (color visualization), and ii) as a key step of digitally separating chromatic regions of interest for further quantification in automated processing pipelines (color separation). (Received June 26, 2018)