Disclosed is apparatus and method for motion tracking of a subject in medical brain imaging. The method comprises providing a light projector and a first camera; projecting a first pattern sequence (S1) onto a surface region of the subject with the light projector, wherein the subject is positioned in a scanner borehole of a medical scanner, the first pattern sequence comprising a first primary pattern (P1,1) and/or a first secondary pattern (P1,2); detecting the projected first pattern sequence (S1') with the first camera; determining a second pattern sequence (S2) comprising a second primary pattern (P2,1) based on the detected first pattern sequence (S1'); projecting the second pattern sequence (S2) onto a surface region of the subject with the light projector; detecting the projected second pattern sequence (S2') with the first camera; and determining motion tracking parameters based on the detected second pattern sequence (S2').