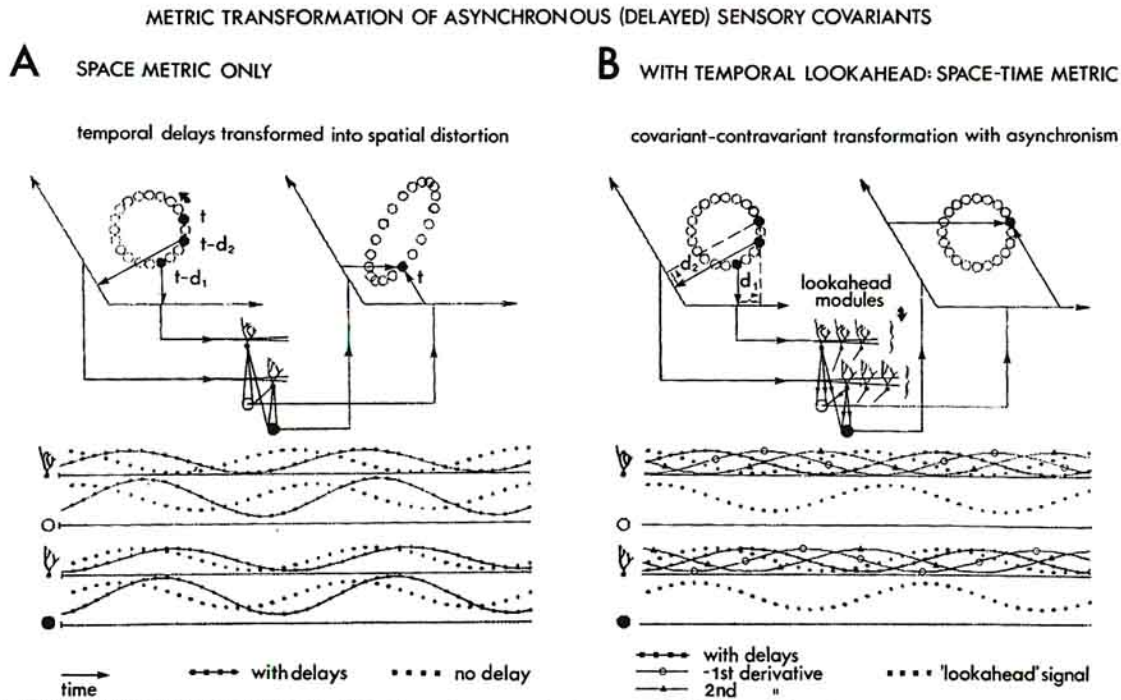

Fig. 4. Transformation, through a space-metric, of asynchronous space-coordinates, contrasted with the transformation *via* a space-time metric. A: Distorted performance through space-metric only. The sensory covariant components v_i incorporate individually different delays d_i in detecting the location of the circling target. If these covariants are taken as referring to simultaneous events and are transformed by a network that represents the metric tensor of the space only, then the motor execution is distorted into an ellipse (right side). B: Proper performance through a predictive, space-time metric tensor. The delayed covariants undergo a temporal 'lookahead' procedure thus yielding a set of temporally extrapolated signals, (shown by dotted lines in the bottom of B). For the 'temporal lookahead' procedure the 0th, 1st and 2nd time derivatives of the covariant sensory signals have to be taken by a 'stack' of neurons shown only symbolically in the middle section of B. From such a 'lookahead-module' the covariant sensory signal is temporally extrapolated on neurons of the cerebellar nucleus that take the weighted sum of derivatives. The activities of the neuronal elements are plotted in the bottom part of B by continuous lines.