

**Fisher, A. C.; Lake, S. P.; Cunningham, I. P.; Chandna, A.**

**Web-strabnet: a web-based expert system for the differential diagnosis of vertical strabismus (squint).** (English) [Zbl 1202.92038](#)  
Comput. Math. Methods Med. 11, No. 1, 89-97 (2010).

Summary: A squint, also known as strabismus, is a condition where the eyes are misaligned because of incorrect balance in the controlling eye muscles. This may result from muscular, neuromuscular or purely mechanical factors. An affected eye will have either predominating vertical or horizontal deviation. Vertical deviations are usually classified into eight classes (diagnoses) and horizontal into 10. The present work considers only the former but extension to the latter is straightforward. The differential diagnosis of strabismus is usually achieved in the prism cover test (PCT). A range of test prisms is presented to the eye and the resulting deviation in a particular direction of gaze is observed. In the full PCT, 10 positions of gaze are considered: in each position there are, say, 40 prisms of plus and minus power to investigate. The problem can be expressed as the inference 1-of-8 diagnoses in the output space from an input space of 10 parameters each with a resolution of 1-in-80. However, in the majority of clinical examinations, the corner-most positions of gaze are difficult to assess, particularly in children. Therefore, frequently the 6-position subset is reported requiring a corresponding reduction in the input space dimensions of 10 to 6. Web-StrabNet<sup>©</sup> is an expert system for the differential diagnosis of strabismus based on parallel instances of multi-layer perceptrons trained on exemplar data generated in consensus by two clinical experts. This machine expert is programmed in MatLab<sup>TM</sup> and is freely available as an Internet website ([www.strabnet.com](http://www.strabnet.com)) which uses *MatSOAP*<sup>©</sup>, an XML/SOAP accessible automation server running a number of simultaneous MatLab instances. StrabNet achieves diagnostic accuracies of 100 and > 94% with artificial data and typically ~ 99 and ~ 99% in clinical data-sets for the 10-position and 6-position subset PCT's, respectively.

**MSC:**

**92C50** Medical applications (general)

**68T35** Theory of languages and software systems (knowledge-based systems, expert systems, etc.) for artificial intelligence

Cited in 1 Document

**Software:**

Matlab; Web-strabnet

**Full Text:** [DOI](#) [EuDML](#)