Storing directionality in axial lines using complex node depths

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Abstract
This paper proposes that in order to implement an angular-based choice[1] algorithm it is first necessary to implement a new type of *depth* definition. Such a depth algorithm would not only calculate the 'minimum' angular depth from any origin to any destination (as per Dalton, 2001) but specifically stores the depth as *complex number*, which additionally represents the cumulative angle that facilitated that particular minimum angular depth calculation. By using such a representation it becomes possible to compute the unique angle of intersection of any two axial lines, where the starting-direction of a hypothetical individual travelling from one axial line to another is known. This paper concludes with the suggestion that the use of complex number depths (namely depths that have a real and imaginary component) is an interesting and valuable extension of the concept of depth; originally depth could take only an integer value, this was then extended to a real numbers (angular depth) and finally has been extended once more by utilising complex numbers. The use of such an algorithm, as will be described in this paper, to calculate *complex depth* can then be used to compute true angular depth and hence *angular choice* for any given axial system. This paper will present the proposed algorithm and new measure in full.

Keywords
angular depth, fractional integration, choice measure, directinality

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