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\textsuperscript{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.