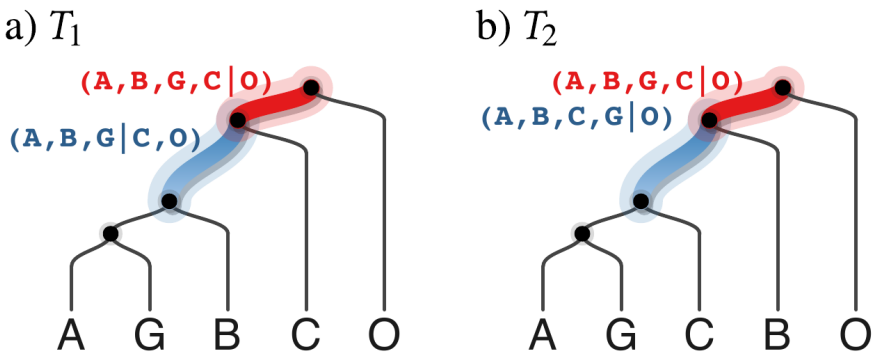
Unique Split / Changing Branch

Adjacent Common Branch

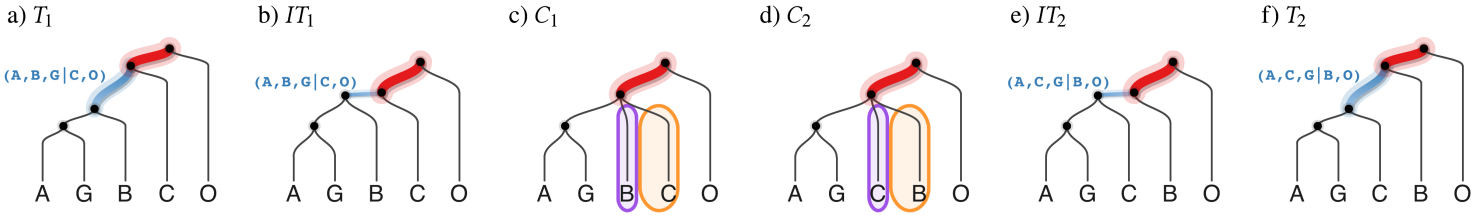
Unchanged Common Branch

Figure A: Keyframes (T_1 and T_2)



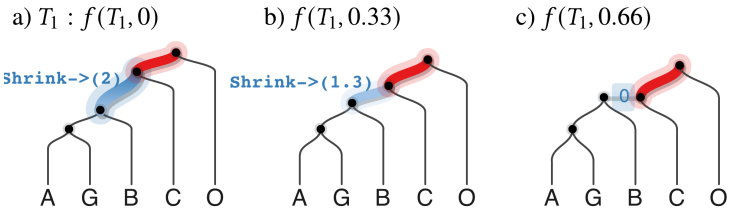
Start (T_1, left) and end (T_2, right) trees used as keyframes for interpolation. T_1 and T_2 are the start and end trees used as keyframes for interpolation. Branch colors indicate their role: black for unchanged common splits, red for common splits adjacent to the unique splits, and blue for unique splits present only in T_1 or T_2. Initially, in T_1, the blue branch (unique split (A,B,G)) neighbors a red branch in T_1. and in the T_2. The red split is the common split existing in both trees, adjacent to the unique splits.

Figure B: Interpolation Sequence via Split-Based Morphing.



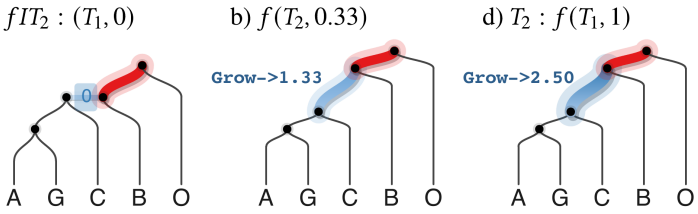
This sequence illustrates the continuous transformation from tree T_1 to T_2 through intermediate stages: T_1, IT_1, C_1, C_2, IT_2, and T_2. The blue branch progressively shrinks and vanishes by stage C_1 (see Fig.C), where the unique split (A,B,G) is deleted, leading to a state where more than two splits become adjacent (see C_1 or C_2). The transition from C_1 to C_2 involves no topological change (the set of splits is identical), but includes a visual rearrangement (node rotation) to align with the T_2 structure. We see leaves B and C (highlighted in boxes) swapping their positions from C_1 to C_2. B is in C_1 at the third position and C in the fourth position, whereas in C_2, C is in the third position and B is in the fourth position. The order of the common splits in C_1 matches that of T_1, and in C_2 matches that of T_2. Subsequently, a new blue branch for the unique split (A,C,G) emerges near the red branch in IT_2 (see Fig.D) and elongates to its full length by T_2.

Figure C: Detail - Branch Shortening



Focus on the $\boldsymbol{T_1 \rightarrow IT_1}$ transition (first two trees in Figure B): The branch leading to clade ABG shortens from 2.0 to near-zero.

Figure D: Detail - Branch Elongation



"Focus on the $\boldsymbol{IT_2 \rightarrow T_2}$ transition (last two trees in Figure B): The branch leading to clade ACG appears, elongating from near-zero to 2.5.",