

**Adjacent Sides and Corners Bisectors Theories
in Universal Problem Solving Science
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Mathematical Journal of the "Collegium" All World Academy of Sciences,
Munich (Germany), 13 (2013), 1.

The least square method (LSM) [1] by Legendre and Gauss is practically the unique known one applicable to contradictory (e.g. overdetermined) problems in data processing. Universal mathematics [2-5] discovered many principal LSM defects. Adjacent sides bisectors theory (ASBT) uses coordinate system rotation invariance via data centralization and standardization. In a plane, take a finite overdetermined quantiset [2-5] of n ($n > 2$; $n \in \mathbb{N}^+ = \{1, 2, \dots\}$) linear equations with their quantities $q(i)$

$$q^{(i)}(a_j x + b_j y = c_j) \quad (j = 1, 2, \dots, n) \quad (E_i)$$

and 2 unknown variables x and y with real numbers $q(i) > 0$, a_j , b_j , and c_j . Number the polygon $P_1 P_2 \dots P_n$ vertices $p^{(1)}P_1, p^{(2)}P_2, \dots, p^{(n)}P_n$ and bisectors $p^{(1)}B_1, p^{(2)}B_2, \dots, p^{(n)}B_n$ (with multiplying the line quantities) in the clockwise or anticlockwise order to provide its convexity or the minimum number of nonconvex corners. If by $n > 3$ there is no inscribed circumference whose center is the best quasisolution, subsequently replace every convex vertex with the intersection of its bisector and the straight line segment connecting the both adjacent corners with conserving its quantity. Decrease the polygon with possibly reordering and determine its weighted center.

Adjacent corners bisectors theory (ACBT) also rotation-invariant keeps all the internal intersections of the bisectors of the adjacent corners with replacing each external intersection via the nearest intersection of the bisector of those bisectors with the polygon boundary. Determine the weighted center of the conserved intersections.

To solve equation set $29x + 21y = 50$, $50x - 17y = 33$, $x + 2y = 7$, $2x - 3y = 0$ (Figs. 1, 2),

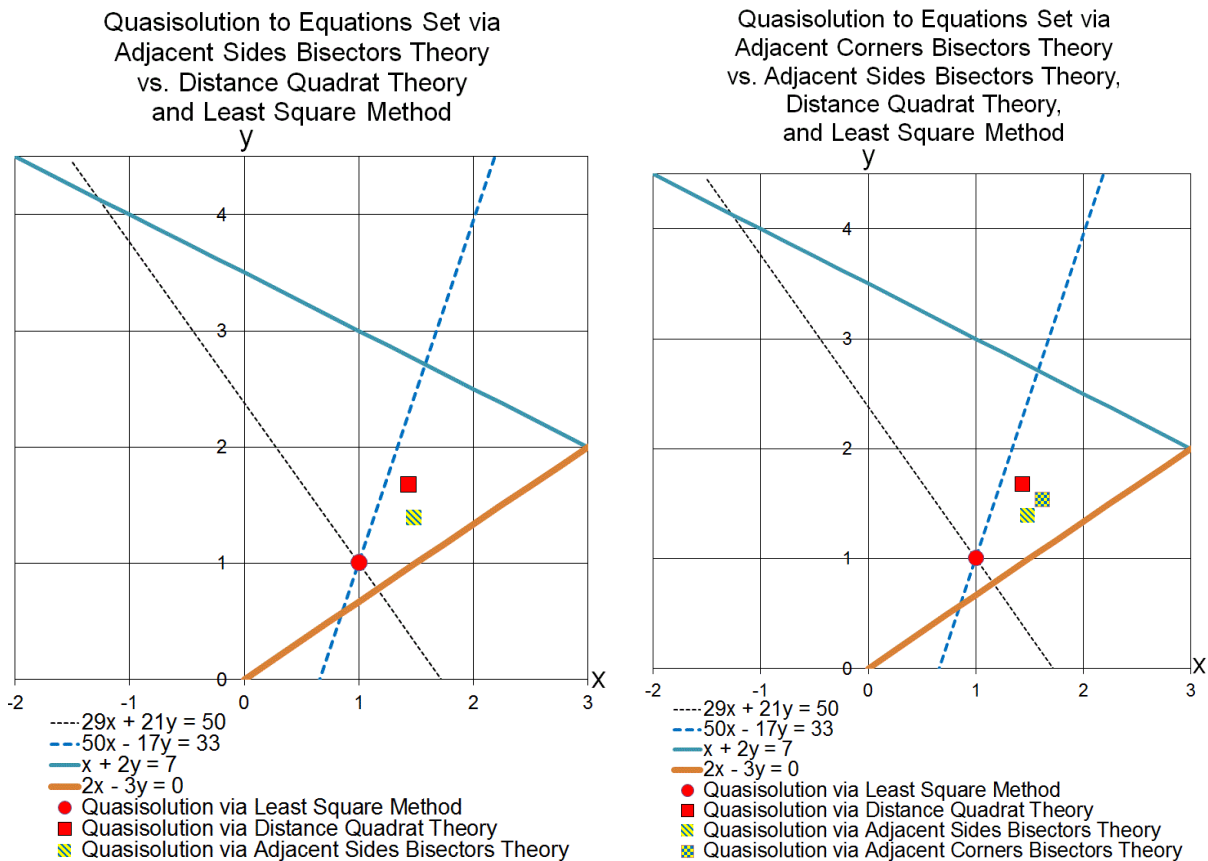


Figure 1. Adjacent sides bisectors theory

Fig. 2. Adjacent corners bisectors theory

compare applying adjacent sides bisectors theory (ASBT) with one step only, adjacent corners bisectors theory (ACBT), distance quadrat theory (DQT) [2-4], and the least square method (LSM).

The LSM gives $x \approx 1.0023$, $y \approx 1.0075$ practically ignoring the last two equations with smaller factors (unlike ASBT, ACBT, and DQT).

Adjacent sides bisectors theory (ASBT) and adjacent corners bisectors theory (ACBT) providing simple explicit quasisolutions to even contradictory problems are very efficient by solving many urgent problems, e.g. in aeronautical fatigue.

Keywords: Ph. D. & Dr. Sc. Lev Gelimson, "Collegium" All World Academy of Sciences, Academic Institute for Creating Fundamental Sciences, Mathematical Journal, Adjacent Sides and Corners Bisectors Theories, Universal Problem Solving Science, least square method, Legendre, Gauss, contradictory overdetermined problem, data processing, universal mathematics, unimathematics, Unimathematik, adjacent sides bisectors theory, coordinate system rotation invariance, quantiset, quantity, linear equation, unknown variable, nonconvexity, inscribed circumference, best quasisolution, vertex, weighted center, nearest intersection, bisector, straight line segment, polygon boundary, reordering, Adjacent corners bisectors theory, distance quadrat theory, aeronautical fatigue, General Problem Theory, Elastic Mathematics, General Strength Theory.

Acknowledgements to Anatolij Gelimson for our constructive discussions on coordinate system transformation invariances and his very useful remarks.

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