	abc	$\neg abc$	$a\neg bc$	$ab\neg c$	$\neg a\neg bc$	$\neg ab\neg c$	$a\neg b\neg c$	$\neg a\neg b\neg c$
φ	0	0	0.5	0	1	0	0	0.5
ψ	0.5	1	0.5	0	0	0	0	0
$\delta^1_{c(\psi)}(\varphi)$	0.5	0	0.5	0	1	0.5	0.5	1
$\delta^2_{c(\psi)}(\varphi)$	0.5	0	0.5	0.5	1	1	1	1
$\delta^3_{c(\psi)}(\varphi)$	0.5	0	0.5	1	1	1	1	1
$\delta^4_{c(\psi)}(\varphi)$	0.5	0	0.5	1	1	1	1	1
$d(0) = \delta^0_{c(\psi)}(\varphi)$	0	0	0.5	0	1	0	0	0.5
$d(1) = \delta^1_{c(\psi)}(\varphi) \wedge c(\delta^0_{c(\psi)}(\varphi))$	0.5	0	0.5	0	0	0.5	0.5	0.5
$d(2) = \delta^2_{c(\psi)}(\varphi) \wedge c(\delta^1_{c(\psi)}(\varphi))$	0.5	0	0.5	0.5	0	0.5	0.5	0
$d(3) = \delta^3_{c(\psi)}(\varphi) \wedge c(\delta^2_{c(\psi)}(\varphi))$	0.5	0	0.5	0.5	0	0	0	0
$d(4) = \delta^4_{c(\psi)}(\varphi) \wedge c(\delta^3_{c(\psi)}(\varphi))$	0.5	0	0.5	0	0	0	0	0

Table 1: Values of conditional dilations and fuzzy distances $d(n) = d(\omega, (\varphi, \psi))(n)$ for the example in Figure 7.

the comparison methods, and at exploring the suggested applications as well as new ones, including the choice of the most appropriate definition.

References

[1] D. Dubois, S. Kaci, and H. Prade. Bipolarity in Reasoning and Decision, an Introduction. In *International Conference on Information Processing and Management of Uncertainty, IPMU'04*, pages 959–966, Perugia, Italy, 2004.

[2] D. Dubois and H. Prade (Eds.). Special issue on bipolar representations of information and preference. *International Journal of Intelligent Systems*, 23(8-10), 2008.

[3] M. De Calmès, D. Dubois, E. Hullermeier, H. Prade, and F. Sedes. Flexibility and fuzzy case-based evaluation in querying: An illustration in an experimental setting. *International Journal of Uncertainty, Fuzziness and Knowledge-Based Systems*, 11(1):43–66, 2003.

[4] I. Bloch. Mathematical morphology on bipolar fuzzy sets: general algebraic framework. *International Journal of Approximate Reasoning*, 53:1031–1061, July 2012.

[5] J. Serra. *Image Analysis and Mathematical Morphology.* Academic Press, London, 1982.

[6] I. Bloch and H. Maître. Fuzzy Mathematical Morphologies: A Comparative Study. *Pattern Recognition*, 28(9):1341–1387, 1995.

[7] I. Bloch. Duality vs. Adjunction for Fuzzy Mathematical Morphology and General Form of Fuzzy Erosions and Dilations. *Fuzzy Sets and Systems*, 160:1858–1867, 2009.

[8] B. De Baets. Fuzzy Morphology: a Logical Approach. In B. Ayyub and M. Gupta, editors, *Uncertainty in Engineering and Sciences: Fuzzy Logic, Statistics and Neural Network Approach*, pages 53–67. Kluwer Academic, 1997.

[9] M. Nachtegael and E. E. Kerre. Classical and Fuzzy Approaches towards Mathematical Morphology. In E. E. Kerre and M. Nachtegael, editors, *Fuzzy Techniques in Image Processing*, Studies in Fuzziness and Soft Computing, chapter 1, pages 3–57. Physica-Verlag, Springer, 2000.

[10] I. Bloch. Dilation and Erosion of Spatial Bipolar Fuzzy Sets. In *International Workshop on Fuzzy Logic and Applications WILF 2007*, volume LNAI 4578, pages 385–393, Genova, Italy, jul 2007.

[11] P. Sussner, M. Nachtegael, T. Mélange, G. Deschrijver, E. Esmi, and E. Kerre. Interval-Valued and Intuitionistic Fuzzy Mathematical Morphologies as Special Cases of L-Fuzzy Mathematical Morphology. *Journal of Mathematical Imaging and Vision*, 43(1):50–71, 2012.

[12] H. J. A. M. Heijmans and C. Ronse. The Algebraic Basis of Mathematical Morphology – Part I: Dilations and Erosions. *Computer Vision, Graphics and Image Processing*, 50:245–295, 1990.

[13] G. Deschrijver, C. Cornelis, and E. Kerre. On the Representation of Intuitionistic Fuzzy t-Norms and t-Conorms. *IEEE Transactions on Fuzzy Systems*, 12(1):45–61, 2004.

[14] I. Bloch and J. Lang. Towards Mathematical Morpho-Logics. In *8th International Conference on Information Processing and Management of Uncertainty in Knowledge based Systems IPMU 2000*, volume III, pages 1405–1412, Madrid, Spain, 2000.

[15] I. Bloch. A Contribution to the Representation and Manipulation of Fuzzy Bipolar Spatial Information: Geometry and Morphology. In *Workshop on Soft Methods in Statistical and Fuzzy Spatial Information*, pages 7–25, Toulouse, France, sep 2008.

[16] I. Bloch. On Fuzzy Distances and their Use in Image Processing under Imprecision. *Pattern Recognition*, 32(11):1873–1895, 1999.

[17] I. Bloch. Fuzzy Skeleton by Influence Zones - Application to Interpolation between Fuzzy Sets. *Fuzzy Sets and Systems*, 159:1973–1990, 2008.

[18] D. Dubois and H. Prade. Ranking fuzzy numbers in the setting of possibility theory. *Information Sciences*, 30(3):183–224, 1983.

[19] D. Dubois, H. Fargier, and J.F. Bonnefon. On the qualitative comparison of decisions having positive and negative features. *Journal of Artificial Intelligence Research*, 32(1):385–417, 2008.

[20] I. Bloch, R. Pino-Pérez, and C. Uzcátegui. Explanatory Relations based on Mathematical Morphology. In *ECSQARU 2001*, pages 736–747, Toulouse, France, sep 2001.

[21] I. Bloch, R. Pino-Pérez, and C. Uzcategui. Mediation in the Framework of Morphologic. In *European Conference on Artificial Intelligence ECAI 2006*, pages 190–194, Riva del Garda, Italy, 2006.

[22] S. Benferhat, D. Dubois, S. Kaci, and H. Prade. Bipolar Possibility Theory in Preference Modeling: Representation, Fusion and Optimal Solutions. *Information Fusion*, 7:135–150, 2006.