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                       Problem -- Chapter 4. Roughness and Fuzziness, etc.

   Sommario/riassunto This book combines computational intelligence and mathematics to
                       solve theoretical and real-world problems. The real challenges of
                       engineering and other applied sciences, e.g. economics and
                       management, the social sciences, etc., and even everyday life, are
                       increasingly raising complex problems – both in the usual sense, but
                       also in the mathematical and theoretical computer science sense, which
                       is referred to as intractability. Finding exact solutions to the latest
                       problems in mathematics is impossible, and it has been also shown

that no further technical advance will ever make it possible to find general and exact solutions to such complex problems. Rather, the goal is to find solutions that are "good enough" or "acceptably accurate," including models and corresponding algorithms, which is most often achieved by combining traditional mathematical techniques and computational intelligence tools, such as fuzzy systems, evolutionary and memetic algorithms, and artificial neural networks. Consequently, international funding programs, such as the European Commission's current framework program for research and innovation (Horizon 2020), and the preliminary research team building COST Actions, are devoted to developing new instruments for tackling the challenges that we face in the current technological age. And it goes without saying that research topics concerning the interactions between computational intelligence and traditional mathematics play a key role in overcoming the obstacles associated with the intractability of complex problems. In this book, mathematicians, engineers, and other scientists highlight novel methodological results connecting these two main research areas, and focusing on solving real-life problems.