

# Technology Transfer

## Two Computer-based Diagnostic Systems for Diseases, Insect Pests, and Physiological Disorders of Citrus and Selected Tropical Fruit Crops

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**SUMMARY.** The TFRUIT-Xpert and CIT-Xpert computer-based diagnostic programs can quickly assist commercial producers, extension agents, and homeowners in the diagnosis of diseases, insect pest problems and physiological disorders. The CIT-Xpert system focuses on citrus (*Citrus* spp.), whereas the TFRUIT-Xpert system focuses on avocado (*Persea americana* Mill.), carambola (*Averrhoa carambola* L.), lychee (*Litchi chinensis* Sonn.), mango (*Mangifera indica* L.), papaya (*Carica papaya* L.), and "Tahiti" lime (*Citrus latifolia* Tan.). The systems were

developed in cooperation with research and extension specialists with expertise in the area of diagnosing diseases, disorders, and pest problems of citrus and tropical fruit. The systems' methodology reproduces the diagnostic reasoning process of these experts. Reviews of extension and research literature and 35-mm color slide images were completed to obtain representative information and slide images illustrative of diseases, disorders, and pest problems specific to Florida. The diagnostic programs operate under Microsoft-Windows. Full-screen color images are linked to symptoms (87 for CIT-Xpert and 167 for TFRUIT-Xpert) of diseases, disorders, and insect pest problems of citrus and tropical fruit, respectively. Users can also refer to summary documents and retrieve management information from the Univ. of Florida's Institute of Food and Agricultural Sciences extension publications through hypertext links. The programs are available separately on CD-ROM and each contains over 150 digital color images of symptoms.

Expert systems have been developed from a branch of computer science known as artificial intelligence (Liebowitz, 1988). Artificial intelligence is primarily concerned with knowledge representation, problem solving, learning, robotics, and the development of computers that can speak and understand humanlike languages (Townsend, 1987). An expert system is a computer program that uses knowledge to solve problems that are difficult enough to require significant human expertise (Townsend, 1987). Simply stated, expert systems are computer programs designed to mimic the thought and reasoning processes of a human expert.

Expert systems can be developed for many kinds of applications involving diagnosis, prediction, consultation, information retrieval, control, planning, interpretation, and instruction (Edmonds, 1988; Liebowitz and DeSalvo, 1989; Peart, 1989). They are used in applications where the procedures or algorithms for the problem do not exist or are poorly defined, but good rules of thumb or heuristics are available. Although the use of expert systems in horticulture is still limited and their primary function is as a tool for human experts, expert systems are rapidly being accepted for use by the nonexpert to solve problems when human expertise is expensive, untimely, or unavailable. Today, better development tools are available as closer interdisciplinary cooperation is resulting in agricultural researchers' gaining more insight into the theory and concepts necessary to build effective systems (Crassweller et al., 1993; Holt, 1989).

Several notable expert systems have been developed for use in horticulture. For example, CALEX is an expert system that was developed for the diagnosis of peach and nectarine plant problems by the Univ. of California (Plant et al., 1989). Like most experts systems, CALEX is a rule-based system and uses certainty factors, so that the knowledge base consists of production rules in the form of IF-THEN statements. The inference engine pieces together chains of rules in an attempt to reach a conclusion. The knowledge base of the CALEX diagnostic system contains about 600 rules for the diagnosis of 120 problems of peaches and nectarines, representing most of the production problems in California (Plant et al., 1989). CITPATH, a computerized diagnostic key and information system, was developed to identify five major fungal diseases of citrus foliage and fruit

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# Computerbased Diagnostic Systems

**Didier Musso**



## **Computerbased Diagnostic Systems:**

**Computer-Based Diagnostic Systems** Chris Price,2012-12-06 Computer based diagnostic systems are among the most successful applications of knowledge based systems KBS technology Chris Price shows the best way to build effective diagnostic systems for different types of diagnostic problems by giving examples of different solutions to the problem of building effective diagnostic systems helping you to decide on an appropriate strategy for building a diagnostic system to aid troubleshooting of that diagnostic problem showing how to use diagnostic fault trees as a common representation for discussing different ways of approaching diagnosis Computer Based Diagnostic Systems is written in such a way as to make the material easy to understand even when you do not have easy access to the commercial tools *Computer Based Diagnostic Systems* Eta Berner,1998-07-01

**Clinical Decision Support Systems** Eta S. Berner,2013-06-29 Written by nationally and internationally recognised experts on the design evaluation and application of such systems this book examines the impact of practitioner and patient use of computer based diagnostic tools It serves simultaneously as a resource book on diagnostic systems for informatics specialists a textbook for teachers or students in health or medical informatics training programs and as a comprehensive introduction for clinicians with or without expertise in the applications of computers in medicine who are interested in learning about current developments in computer based diagnostic systems Designed for a broad range of clinicians in need of decision support Nuclear Powerplant Safety Systems United States. Congress. House. Committee on Science and Technology. Subcommittee on Energy Research and Production,1979

**Cumulated Index Medicus** ,1994 **Hazards XV** Institution of Chemical Engineers (Great Britain). North Western Branch,2000 Experts from the fields of process safety and environmental protection discuss their work **MEDINFO 2001** Vimla L. Patel,Ray Rogers,Reinhold Haux,2001 Technological infrastructure Standards for interworking Human computer interaction Knowledge representation Information management Decision support Electronic patient records Health information systems Patient care aspects telematics **Proceedings of the IEEE Engineering in Medicine and Biology Society, Region 8 International Conference** ,1997 **Proceedings, Rensselaer's Second International Conference on Computer Integrated Manufacturing** ,1990 **Research Awards Index** ,1987 **American Papermaker** ,1990

Computers in Clinical Practice Jerome A. Osheroff,1995 Computers in Clinical Practice is specially designed to lead you through the maze of information resources and show you how to apply computer technology to your daily practice and improve patient care Technology can make it easier to access current clinical information perform repetitive tasks such as generating prescriptions and maintaining patient schedules or communicate conveniently with colleagues around the world This comprehensive and essential guide cuts through the jargon and intricate terminology and provides thoughtful advice on how to choose the technology most appropriate for you **Industrial Process Control Systems** L. Boullart,E. van Ravenzwaaij,J. P. Jansen,1989 Hardbound With the much publicized industrial disasters which have occurred recently

Chernobyl and Piper Alpha the importance of reliability and safety within industry has come to the forefront These Proceedings are divided into three sessions as follows industrial process control systems for safety applications expert systems and diagnostics and reliability procedures and guidelines Papers were presented on the basics of reliability and availability theory aiding techniques for example expert systems and software developments in a variety of areas ranging from mathematics to engineering These Proceedings will be a useful reference source for all those involved in the safety and maintenance of industrial systems

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Towards Fifth-generation Computers Geoffrey Leslie Simons,1983    **Proceedings of the Topical Meeting on Computer-Based Human Support Systems: Technology, Methods, and Future, Philadelphia, Pennsylvania, June 25-29, 1995** ,1995    **Energy Research Abstracts** ,1977 Semiannual with semiannual and annual indexes References to all scientific and technical literature coming from DOE its laboratories energy centers and contractors Includes all works deriving from DOE other related government sponsored information and foreign nonnuclear information Arranged under 39 categories e g Biomedical sciences basic studies Biomedical sciences applied studies Health and safety and Fusion energy Entry gives bibliographical information and abstract Corporate author subject report number indexes    **Naval Engineers Journal** ,1995    *INIS Atomindex* ,1985

## The Enigmatic Realm of **Computerbased Diagnostic Systems**: Unleashing the Language is Inner Magic

In a fast-paced digital era where connections and knowledge intertwine, the enigmatic realm of language reveals its inherent magic. Its capacity to stir emotions, ignite contemplation, and catalyze profound transformations is nothing lacking extraordinary. Within the captivating pages of **Computerbased Diagnostic Systems** a literary masterpiece penned with a renowned author, readers attempt a transformative journey, unlocking the secrets and untapped potential embedded within each word. In this evaluation, we shall explore the book's core themes, assess its distinct writing style, and delve into its lasting effect on the hearts and minds of people who partake in its reading experience.

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