The IEEE International Conference on Tools with Artificial Intelligence (ICTAI) is a leading IEEE-CS annual scientific meeting for three decades. It provides a major international forum where the creation and exchange of ideas related to artificial intelligence are fostered among academia, industry, and government agencies. The conference facilitates the cross-fertilization of these ideas and promotes their transfer into practical tools, for developing intelligent systems and pursuing artificial intelligence applications. The ICTAI encompasses all technical aspects of specifying, developing and evaluating the theoretical underpinnings and applied mechanisms of the AI-based components of computer tools such as algorithms, architectures and languages.

**FIRST CALL FOR PAPERS**

The theme of this conference is **Tools with Artificial Intelligence**.

**Topics (but not limited) to**

- **AI Foundations**
  1. Evolutionary computing, Bayesian and Neural Networks
  2. Decision/Utility Theory and Decision Optimization
  3. Search, SAT, and CSP
  4. Description Logic and Ontologies

- **AI in Domain-specific Applications**
  1. AI in Computational Biology, Medicine and Biomedical Applications
  2. AI in WWW, Communication, Social Networking, Recommender Systems, Games and E-Commerce
  3. AI in Finance and Risk Management

- **AI in Computer Systems**
  4. AI in Robotics, Computer/Vision and Games
  5. AI in Natural Language Processing
  7. AI in Cloud Computing, Data-intensive Applications and Online/Streaming and Multimedia Systems
  8. AI in Web Search and Information Retrieval
  9. AI in Computer Security, Data Privacy, and Information Assurance

- **AI in Data Analytics and Big Data**
  10. Visual Analytics for Big Data
  11. Computational Modeling for Big Data
  12. Large-scale Recommendation and Social Media Systems
  13. Cloud/Grid/Stream Data Mining for Big Velocity Data
  14. Semantic-based Big Data Mining

- **AI in Smart Cities**
  Healthcare, Traffic, Transportation, Environment, etc.

- **Machine Learning and Data Mining**
  1. Pre-processing, Dimension Reduction and Feature Selection
  2. Learning Graphical Models and Complex Networks
  3. Active, Cost-Sensitive, Semi-Supervised, Multi-Instance, Multi-Label and Multi-Task Learning
  4. Transfer/Adaptive, Rational and Structured Learning
  5. Preference/Re-ranking, Ensemble, and Reinforcement Learning

- **Knowledge Representation, Reasoning and Cognitive Modelling**
  1. Knowledge Representation, Reasoning
  2. Knowledge Extraction, Management and Sharing
  3. Case-based Reasoning and Knowledge-based Systems
  4. Cognitive Modelling and Semantic Web

- **AI and Decision Systems**
  1. Decision Guidance and Support Systems
  2. Optimization-based Recommender Systems
  3. Group, Distributed, and Collaborative Decisions
  4. Crowd-sourcing and Collective Intelligence Decision-making
  5. Strategic, Tactical and Operational-level Decisions
  6. Decision-making in Social and Mobile Networks

- **Uncertainty in AI**
  1. Uncertainty and Fuzziness Representation and Reasoning
  2. Approximate/Exact Probabilistic Inference
  3. Knowledge Discovery and Data Mining for Uncertain

**Paper Submission**
The submissions should contain original, high quality, not submitted or published elsewhere work. Papers should be submitted electronically (through ICTAI 2021 web site) in pdf format and should conform to IEEE specifications (single-spaced, double-column, 10-point font size, up to 8 pages).

**Paper Presentation**
Each accepted paper should be presented by one of the authors and accompanied by at least one full registration fee payment, to guarantee publication in the proceedings. All accepted papers will be included in proceedings of ICTAI 2021 that will be published by the IEEE Computer Society.

**IJAIT special issues**
Extended versions of the best papers of the conference will be invited for publication in a special issue of the International Journal on Artificial Intelligence Tools (IJAIT) (SCI Indexed).

**Best Student Papers Awards**
ICTAI & BAlF provide financial awards to the top-5 best student papers and to the Best Paper Award.

**Further Information email Chairs**

**General Chair:**
Dr. M. Virvou (mvirvou@uniipi.gr)

**Program Chairs:**
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**Paper submission:** June 20, 2021
**Paper notification:** Aug. 20, 2021
**Camera ready paper:** Sept. 20, 2021