



ORT Braude – Technology Pool

Software Engineering

Bioinformatics

Dr. Zakharia Frenkel

Synopsis: Our singular approach to detecting relationships between protein sequences opens new possibilities for protein sequence structural/functional annotation, sequence alignment, and other studies.

Application fields: Bioinformatics, sequence biology, text mining.

Experience: Seven years' experience in network analysis and k-mismatch search problem.

Research status: About ten scientific papers, research grant from the I. Horwitz Center for Complexity Science, the first patent is in preparation.

Customer benefits: Our approach is able to provide reliable prediction of protein properties unavailable by other methods. Our experience in k-mismatch search can be applied to many fields dealing with complex search methods.

Intelligent Information Systems

Dr. Mati Golani

Synopsis: We provide advanced modeling techniques that incorporate machine learning mechanisms (such as CBR systems and neural networks), pattern recognition, and mining procedures, enabling revelation and computerisation of "hidden" knowledge.

Application field: Production and service enterprises, health service providers and organizations, pharmaceutical industry.

Experience: Over 10 years of experience in business process modeling (as implemented in ERP), and mining; Author of a patent in business process mining; Author of articles and book chapters in diverse publications; On-going research on computational pharmacology assessment tool* (neural network solution based), facial pain recognition monitor (via fuzzy case based reasoning tool); Cooperation with National academic and medical institutes on multi-dimensional analysis of medical data.

Customer benefits: Reduced costs via shorter and more economical solutions, improved management and control, and increased SLA compliance.

* In cooperation with the Department of Biotechnology Engineering at OBC

Data Mining Institute

Prof. Zeev Volkovich

Synopsis: The Data Mining Institute at ORT Braude College was founded by Prof. Zeev Volkovich to focus on research and industrial projects associated with data mining applications. The group comprises 10 faculty members and 4 external researchers.

Application fields: Telecommunication, service fields, medical image processing, and software testing

Experience: The projects include: Heuristic approaches for the search of networks, under the FP7 grant "New Algorithms for Host Pathogen Systems Biology"; Optimization of technical service schedules, supported by the ASTEA Company; Investigation of user activities, under an agreement with the Paris branch of Orange; Infection and protein chain discovery; Medical image processing for white brain matter and bone fracture status in collaboration with physicians at the Ziv Hospital; Intelligent testing and analysis of CONCURRENT software, under a bi-national Czech-Israeli grant.

Research status: About 40 papers were composed in this area, two books and two patents are in process to be submitted.

Customer benefits: The researchers perform big data studies of cluster validation, graph clustering, and application machine learning methodologies, all applicable to medical, biological, cloud computing, and software engineering problems.

Effective Parallel and Distributed Computations on Decomposable Structures

Dr. Elena Ravve

Synopsis: We have a new approach for detecting options for effective parallel and distributed computations on decomposable structures.

Application fields: Databases, CAD tools for both logical and physical VLSI design, verification of logical designs using simulation and formal verification methods and tools, and verification of physical designs.

Experience: IP/PDK integration management and CAD validation.

Customer benefits: Provides reliable prediction of effective parallel and distributed computations on decomposable structures in software and hardware design.

ORT Braude College (OBC) was established in Karmiel with the goal of developing an academic center that would teach the different engineering fields and simultaneously work in cooperation with industry. The College is an integral partner in the Galilee's development and promotion of the region's hi-tech industries. The College's goal — to broaden the accessibility of higher education.

Ofek serves as the major outlet for technology transfer at ORT Braude College (OBC). As a commercial entity, Ofek offers the best infrastructure for presenting OBC's technological and scientific development to industry and institutions. Ofek connects the academic and business worlds through its ability to advance potential research into a competitive advantage.



Industrial Engineering

Scheduling and Staffing under Stochastic Environment

Dr. Yariv N. Marmor

Synopsis: The research is based on novel approaches for scheduling and staffing that take into account not only the systems' operational performances objectives but also the perspectives of its various customers. For example, surgery room scheduling seeks balance between utilization, cost, waiting times, and surgeon loads.

Application fields: Healthcare systems and service sector.

Experience: About 13 years of experience in developing

empirical and theoretical based tools in the healthcare industry; for example, creating a generic simulation tool for the emergency department based on data from six hospitals in Israel, and developing scheduling tools at the Mayo Clinic.

Research status: Research published in scientific papers. Research collaboration with the Mayo Clinic.

Customer benefits: Experience in developing easily adjustable generic tools.



Mechanical Engineering

Improved Accessibility for the Disabled

Dr. Orit Benyamin Braun

Synopsis: יצירת פרויקטים בעלי אוריינטציה שיקומית רב תחומית, המרחיבה את התשתית המחקרית של המכללה. חלק מהמחקרים מערבים כבר היום אנשי סגל מתחומי הנדסה במכללה, כל זאת לטובת יצירת מונון רחב וחדשני של פתרונות לבעיות של אוכלוסייה בעלת צרכים מיוחדים.

Experience: שיתופי הפעולה עם מוסדות אקדמיים חוץ מכללתיים: בית חולים רמב"ם (מחלקת גסטרו), מחלקת איזוטופים), בית חולים נהריה, בית חולים שיבא תל השומר (מחלקת שיקום ילדים), מכון לחקר המוח נצרת, אוניברסיטת חיפה-המחלקה לריפוי בעיסוק. **פרוייקטים נוספים:** הקמת עמדת עבודה המותאמת לאנשים בעלי לקות קוגניטיבית; תכן וייצור של כסא מתכוון המיועד לכיתת ילדים הלוקים בשיתוק מוחין בביה"ס האזורי תפן; תכן של מתקני משחקים לילדים נכים; פתרונות המנגישים את הסביבה ללוקים בשיתוק מוחין (מארג, כפר ורדים, בית ספר ניסוי בתפן).

Research status: זכיה בפרוייקט דגל מכללתי מטעם הו"ת בתקצוב של 420,000 ₪; הליך כתיבת פטנט של מנגנון לקיפול הליכון אחר.

Customer benefits: פתרונות זולים למגזר הנכים המשפרים את העצמאות במרחב הפיסי.

Electrical Engineering

Image Processing and Computer Vision

Dr. Evgeny Gershikov and Dr. Samuel Kosolapov

Synopsis: The image processing group consists of two members. We develop solutions for problems involving computer vision and signal processing, such as automatic detection of objects in images and video sequences and automatic checking and grading of quizzes and exams for academic education. We also explore the effect of automatic interactive tools used at lectures and laboratories on student learning.

Application fields: Object detection and recognition, signal processing tasks, pattern recognition, tools for academic evaluation.

Experience: Dr. Evgeny Gershikov's experience includes nine years in signal and image processing, eight years in computer vision, and three years with the Navy on tasks requiring object detection in marine images. Dr. Samuel Kosolapov has 25 years of experience in the fields of signal and image processing and computer vision.

Research status: About twenty scientific papers, two book chapters.

Customer benefits: Our approach to horizon line detection in marine and airborne images is an efficient method working in varying conditions of terrain type and illumination. Our tools for academic evaluation of students are beneficial in monitoring students' progress during an academic course and evaluating their level of knowledge during the semester.

Biotechnology Engineering

Membrane Protein Structural Biology

Dr. Ilan Samish

Synopsis: We have an integrative approach for the analysis and design of proteins in general and membrane proteins in particular. The computational algorithms include prediction of membrane proteome structural biochemistry, biophysics, and bioinformatics.

Application fields: Membrane Proteome Structural Biochemistry, Biophysics and Bioinformatics.

Experience: Experience of over 15 years in the field, editor of the leading book on computational protein design, author of a patent, leading papers, book chapters and reviews. Co-chair of the leading international meeting on structural bioinformatics and computational biophysics (3Dsig).

Customer benefits: Ability to tailor complex solutions and assess the margin of error in prediction, analysis and design of functional protein structures.

Metabolic Syndrome and Fatty Liver

Prof. Maria Grozovski

Synopsis: The research focuses on a comprehensive approach to improve early diagnostic criteria and treatment of metabolic syndrome and liver diseases. The research is conducted at the Ziv Medical Center in Safed and the Hadassah Medical Center at the Hebrew University in Jerusalem

Application fields: Biochemistry, experimental models in vivo, and laboratory diagnostics of fatty liver disease.

Experience: About 30 years of experience in development of experimental in-vivo models of hypercholesterolemia, atherosclerosis and non-alcoholic steatohepatitis (NASH). Application of biochemical and molecular methods to study aspects of lipid metabolism and oxidative stress.

Research status: Research published in scientific papers and book chapters. Author of 9 patents.

Customer benefits: Use of complex laboratory diagnostics to improve the treatment of fatty liver diseases.

Drug Development Tools

Dr. Harry Langbeim

Synopsis: We assess research data and risks for biomarker qualification for drug development and disease monitoring tools and help to improve efficiency in the regulatory process.

Application fields: Biomarkers, IVD in-vitro diagnostics, biotechnology, and entrepreneurship.

Experience: Over 30 years of experience in leading executive positions provide a thorough understanding of academic and industrial research (global and Israel's healthcare included).

Customer benefits: Tools implementing resource optimization, risks analysis, drug development.



Microencapsulation of Bioactive Materials

Prof. Rosa Azhari, Dr. Idit Golani, Dr. Ditzza Levin

Synopsis: The research focuses on developing tailor-made solutions for encapsulation of bioactive materials including low MW drugs, peptides, and proteins, and developing strategies for targeting the microspheres to specific cells or organs.

Application fields: Pharmaceuticals, vaccines, agriculture, and veterinary applications.

Experience: About 30 years of experience in development of microencapsulation strategies, characterization of microspheres, in-vitro and in-vivo activity assays.

Customer benefits: Tailor-made solutions adapted to the required application and the bioactive substance.

