

# Research



*Posters from the Research Day exhibition (left to right):* Prof. Judith Gal-Ezer, Dr. Ela Zur & Tamar Vilner, "Teaching efficiency in an introductory CS course: An innovative didactic approach" (Graphic design: Nava Shenkman); Dr. Nitza Geri, "Feasibility aspects of interorganizational systems for e-commerce" (Graphic design: Nira Arbel); Dr. Esther Eisenmann, "Medieval interpretations of Maimonides' Thirteen Principles" (Graphic design: Nira Arbel); Dr. Galit Adam, "Prosodic effects on morphological development: A study of the acquisition of Arabic and Hebrew" (Graphic design: Shlomit Shemer); Dr. Joel Klemes and Prof. Yoram Eshet, "Digital games: The characteristics of an emerging culture" (Graphic design: Laura Grinberg); Prof. Henry Wassermann, "The German language in the Land of Israel, 1933-2005" (Graphic design: Avi Hatam); Dr. David Levin, "Youth cultures, here and there: Nature, temperament, and linguistic analysis" (Graphic design: Zeev Pearl); Dr. Ronit Bogler, Dr. Avner Caspi & Dr. Sonia Roccas, "Leadership style in an asynchronous, internet-based, learning environment" (Graphic design: Yarden Zahavi).

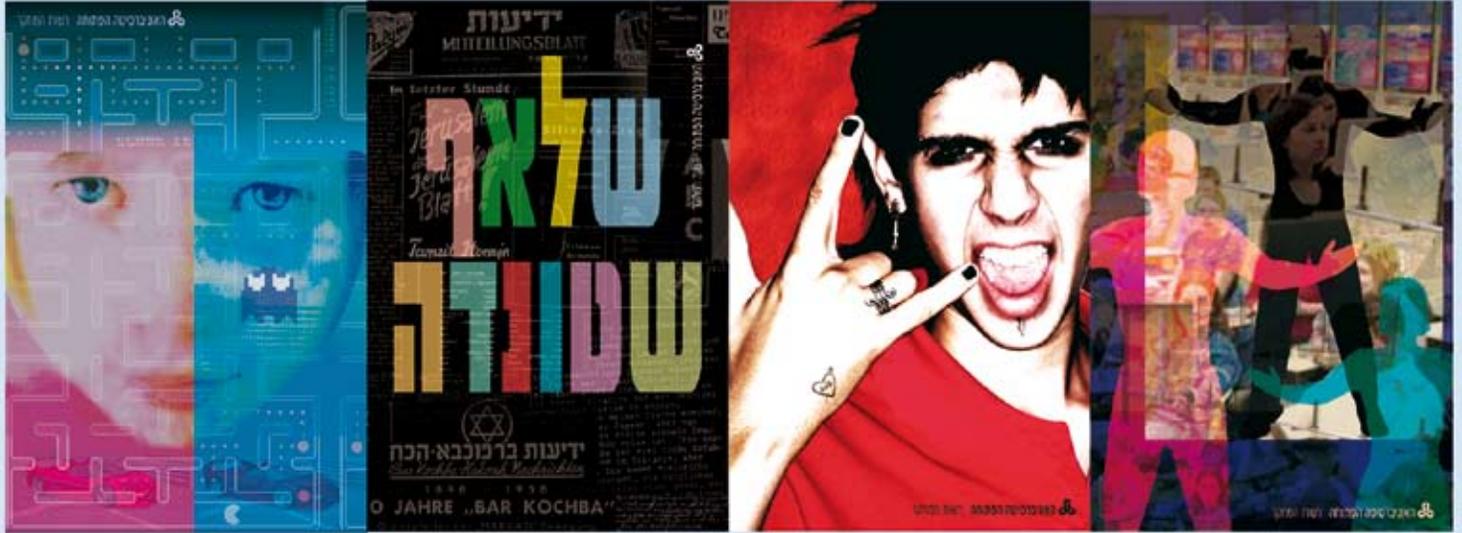
OUI faculty members deal in research in varied fields representing the different knowledge areas: Social Sciences, Humanities, Natural Sciences, Exact Sciences and Engineering.

## Research Authority Activities

The Research Authority supports research activities by identifying external funding sources, providing assistance in submitting proposals to these sources as well as to the internal fund that awards research grants and scholarships.

**Formulating policy for managing intellectual property:** An ad-hoc committee headed by the head of the Research Authority formulated procedures for ensuring the University's intellectual property rights and discussed ways to realize the commercial potential embodied in the fruits of University activities for the general good, for the benefit of the University and for appropriately rewarding the developers. A document of recommendations regarding OUI intellectual property policy addresses all aspects of this issue including the products of research conducted by senior academic faculty and academic teaching staff members, technological developments by OUI employees, print or online study materials developed for OUI courses and developments by *Shoham* and the Computer Unit.

**Agreement between the Open University and Tel Aviv University:** An agreement between the OUI and Tel Aviv University establishes collaboration between the two institutions and enables faculty members in experimental fields to expand their research activities and conduct independent research using Tel Aviv University infrastructures, ensuring stability and continuity over time. OUI faculty members also conduct joint research with colleagues from other universities.



**Approval to perform experiments on animals:** The Ministry of Health Council for Experiments on Animals decided to recognize the OUI as an institution authorized to conduct experiments on animals.

**Formulating policy for the use of research residues:** The Research Authority formulated procedures for appropriate operation, management and control of research budget refunds in order to ensure their utilization for promoting research.

**Research Website:** A website was designed to present research as the focus of the academic endeavor. The website details research conducted by OUI departments and the research topics of academic faculty members. The site also includes a system enabling users to search for studies by topic and to use free text to search researchers' CVs.

**Contacts with national and international research management bodies:** A representative of the OUI Research Authority is a member of the Forum of Research Authority Directors in Universities in Israel, the European Association of Research Authority Directors, and a committee of the Israel Academy of Sciences established to design a national database on research in Israel. This year the OUI hosted two symposia on the Raanana campus in collaboration with the Israel Research and Development Administration to the European Union for Information Technologies (ICT – Information and Communications Technology), as part of events launching the European Union's Seventh Framework Programme for research and technology development (FP7) in Israel, with the participation of senior representatives of the European Commission.

**Annual Research Day:** The OUI held its annual research day for the second time, dedicated to presenting research activities of the OUI senior faculty and academic teaching staff. Keynote speaker Prof. Hagit Messer-Yaron, Vice President of Research and Development at Tel Aviv University, lectured on the challenges and risks of academic research. Three OUI researchers also presented their studies. Research Day was accompanied by an exhibition, "Research from a Different Perspective," that presented works created by members of the OUI Graphic Design department inspired by the variety of research topics of researchers in different content fields.

## Research Grants Awarded by External Funds in 2006-2007

Eleven studies conducted by Open University faculty were awarded funding from external funds this year:

- **Dr. Manor Mendel** received a grant from the Israel Science Foundation (ISF) for research on "Geometric aspects of metric spaces and their algorithmic applications"
- **Dr. Manor Mendel** (with Dr. Assaf Naor, NYU) also received a grant from the US-Israel Binational Science Foundation (BSF) for research on "Geometric techniques for the analysis and design of algorithms on metric data"
- **Dr. Denis Charbit** received a grant from the Israel Science Foundation (ISF) for research on "French intellectuals and Israel, 1962-1983"
- **Dr. Gal Levy** (with Dr. Zehavit Gross and Dr. Halleli Pinson) received a grant from the Tami Steinmetz Center for Peace Research for research on "The other voice of the conflict: Socialization to the Israeli-Palestinian conflict in a divided society – Theoretical and practical aspects"
- **Dr. Irit Back** received a grant from the Tami Steinmetz Center for Peace Research for research on "The paradox of African unity: African Union intervention in Darfur, 2003-2006"
- **Dr. Baruch Ziv** received a grant from the Israeli Ministry of Environmental Protection for research on "Relationships between synoptic and meso-scale conditions and nitrogen oxide concentrations in Tel-Aviv: Development of a statistical model as a tool for improving forecasting and warning"
- **Prof. Nurith Gertz** received a grant from the Minerva Center for Human Rights for research on "Israeli and Palestinian arts in the service of human rights"
- **Dr. Hagit Meishar-Tal** and **EdnaTal-Elhasid** received a grant from the Inter-University Center for E-learning (MEITAL) for research on "Measuring collaborative learning in Wikis"
- **Dr. Avner Caspi** received a grant from the Inter-University Center for E-learning (MEITAL) for research on "Participation and effectiveness of distance learning using Skype technology"
- **Dr. Tali Heiman** (with Dr. Jacob Burack, McGill University, Montreal, Canada) received a Government of Canada FRP award from the Israel Association for Canadian Studies and The Halbert Centre for Canadian Studies for research on "Personal, familial, and community factors that contribute to academic success and to dropout from school of adolescents in Northern Quebec"
- **Prof. Miriam Souroujon** received a grant from the Israeli Ministry of Health for research on "Novel immunotherapies for Myasthenia Gravis – Studies in experimental autoimmune Myasthenia Gravis"

Two of the studies are described below.

- **Dr. Manor Mendel:** "Geometric aspects of metric spaces and their algorithmic applications"

The last decade has witnessed the development of algorithmic tools based on the geometric theory of discrete metric spaces. As a result, the study of this theory is thriving in theoretical Computer Science. The study will focus on four topics at the junction of algorithms and the theory of discrete metric spaces: **Notions of dimension**. Dimension is a key complexity parameter for many algorithmic tasks on finite metric spaces. Currently, the doubling dimension and growth rate are the only algorithmically usable definitions on abstract finite metric spaces. We propose to study alternative definitions that can "smooth-out" local anomalies which have no significant algorithmic importance. **Notions of embedding**. Many notions of embedding were developed in recent years to support specific algorithmic needs. We propose to study connections between, and extensions of, the new notions, concentrating on path-distortion multi-embedding. **Proximity data-structure**. Recently, new proximity data-structures were suggested based on metric Ramsey subsets. We propose to develop this technique in order to improve the resulting data-structures and extend their scope. **Locality sensitive partitions**. Locality sensitive partitions decompose a metric space such that near points tend to stay together, while distant points tend to split. Locality sensitive partitions have found many algorithmic applications and have emerged as a fundamental tool for analyzing finite metric spaces. We propose to study them systematically.

- **Dr. Denis Charbit:** "French intellectuals and Israel, 1962-1983"

To date, no study has been published on French intellectuals' relationship to Israel. The intellectual mood toward Israel has evolved since the sixties and changed radically. The first part of this research will consider the period before the Six-Day war, called the "French-Israeli honeymoon," that we consider decisive, contrary to the prevalent view that the issue of Israel was raised by French intellectuals only in the aftermath of the Six-Day war and the May 1968 students' revolt. The positive image and the presence of Israel in the French public debate at this time resulted from a powerful attraction exerted by Israel on the French intellectual mind. Apart from the intellectual scene, Israel was also present in popular culture, i.e. songs, movies and popular literature. Our current hypothesis is that while the two modes of expression were formally unrelated, both were molded by the same concepts, among which we can clearly perceive a sense of duty toward the Jewish people after the Holocaust. The second part will deal with the intellectual reactions immediately preceding and following the Six-Day War; and the third part with the impact of the 1968 May revolt on the Israel issue, up to the October War in 1973. At this time, some intellectuals laid down the initial foundations of pro-Palestinian political support. In the fourth and last part, we verify some hypotheses to explain the success of this counter-image that maintained itself between 1973 and 1982 and competed with Israel's earlier image. We will describe how the pro-Israeli trend was progressively reversed, culminating in the Lebanon war, and summed up by Alain Finkielkraut in what he called *La Réprobation d'Israël*.

### Research Grants from the Open University Research Authority Fund

In 2006-2007, 101 requests for funding were submitted to the internal fund. The Steering Committee approved 73 requests: 4 research grants; 3 research grants for on-going / exploratory research; 7 limited grants for on-going / exploratory research; 5 research scholarships; 2 grants of excellence for doctoral students; 33 grants for continuing education research; 1 grant for research laboratory work; 5 grants for partial scholarships for students doing research with senior faculty members; 2 grants for master's students; 4 grants for academic teaching staff to free time for research; 7 publishing grants.

Below are short descriptions of three of the studies that received grants from the internal fund.

- **Dr. Ravid Doron, Psychology: The maternal separation model: The role of monoaminergic and neuroendocrine systems, and the effect of treatment**

Repeated exposure to stressors early in life has effects on stress-responsive neurobiological systems that persist throughout life. Maternal separation (MSP) is an established animal model for early stress and adverse experience. Accumulating evidence shows that separating pups from the dam and nest for 3 or more hours per day during the first two postnatal weeks produces exaggerated hypothalamic-pituitary-adrenal (HPA)-axis response to stress in adulthood. In addition, long-lasting changes in various measures of emotion-related behavior, including anxiety-related behaviors, have been observed. Alterations in the monoaminergic system probably play a role in MSP-induced anxiety-like behavior, though their function in this model is not well-defined. Since anxiety disorders are one of the top public health concerns, finding treatments for these disorders caused by early life stress is most important. The main goals of the present study are to examine the long-term responses of the neuroendocrine and especially the central monoaminergic systems to maternal separation in adult mice. In addition, we will assess the effects of two types of treatments on anxiety-like behavior and neuroendocrine and monoaminergic parameters in MSP mice.

- **Dr. Michael Langberg, Computer Science: Clustering of incomplete data**

One of the great challenges in computational theory is the extraction of patterns from massive and high-dimensional data sets, e.g., clustering. The usual starting point is an input set consisting of a list of empirically gathered data points in  $R^d$ . One of the serious gaps between statistical theory and practice, however, lies with incompletely-specified data. The issue is that a high-dimensional data point is not specified by one "measurement" but by many, and that some of those measurements may be missing. From a geometric viewpoint, a data item for which some measurements are missing is simply an affine subspace. In this proposal we address the algorithmic task of clustering

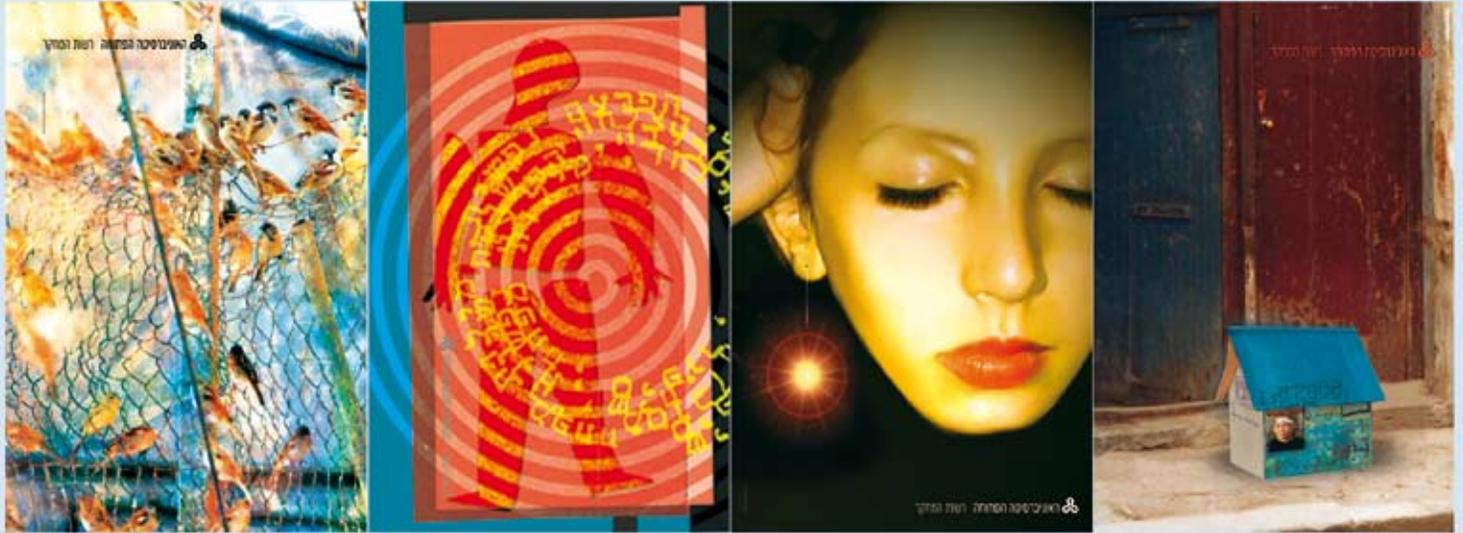


Posters from the Research Day exhibition (left to right): Dr. Tamir Tassa, "k-Anonymization with minimal loss of information" (Graphic design: Nava Shenkman); Prof. Nilli Diengott, "Arnold's 'The Function of Criticism at the Present Time': 'Finally, there is the systematic judgment... the most worthless of all'" (Graphic design: Laura Grinberg); Dr. Anat Lerner (with Guy Sagi), "Chord rooted forest algorithm for searching a grid network" (Graphic design: Yarden Zahavi); Dr. Mustafa Kabha, "Journalism in the eye of the storm" (Graphic design: Avi Hatam); Dr. Vadim Grinshtein, "A Bayesian approach to the normal means problem" (Graphic design: Nira Arbel); Dr. Iris Manor-Binyamini, "The transferability of keywords between doctors and educators in collaborative discourse" (Graphic design: Shlomit Shemer); Dr. Michael Gaft, "Distinguishing luminescence under laser excitation" (Graphic design: Zeev Pearl); Dr. Gal Levy, "Strangers Within: An Exercise in the Politics of Citizenship" (Graphic design: Laura Grinberg).

incomplete data. We propose a systematic study of the major clustering objectives when applied to incomplete data. This project involves both the development of new methodological tools in the design of approximation algorithms, and the study of existing algorithmic techniques – focusing on the development of the theory needed in order to expand these techniques to handle the task of clustering incomplete data.

- **Prof. Aviad Heifetz, Economics: Games with asymmetric awareness**

Unawareness is probably the most common and important kind of ignorance. Science is directed to discover facts that we were previously unaware of. Businesses invest in creating and exploiting novelties, etc. Yet, models of incomplete information used throughout economics, game theory and decision theory preclude non-trivial unawareness (Dekel, Lipman & Rustichini, 1998). The project aims to overcome this unrealistic assumption. We plan to develop a generalized model that allows for unawareness and probabilistic beliefs among several individuals. We expect to apply this model to develop Bayesian games with unawareness, define equilibrium, prove existence, and characterize their structure.



## Honors and Awards

- The distinguished SIGCSE Award for 2007 for outstanding contributions to computer science education was awarded to **Prof. Judith Gal-Ezer** for her contribution as a researcher and designer of CS curricula and for her pioneering research in computer science education. The award was conferred by the Association for Computing Machinery (ACM) SIG on Computer Science Education. The ACM is the foremost association of computer science professionals worldwide.
- **Prof. Aviva Haramish** was awarded the Yonathan Shapiro Prize of the Association for Israel Studies for the best book in Israel Studies published in 2006 for her book, *A Dual Race Against Time: Zionist Immigration Policy in the 1930s*, published by Yad Ben Zvi (in Hebrew).
- **Dr. Haim Saadon**, scientific editor of the series *Jewish Communities in the Middle East* that includes Yemen, Iraq, Morocco, Tunisia and Iran, received the Gaon Prize of the World Sephardi Federation this year for academic studies that forged a new path for understanding the history of the Jews in Islamic countries; for his extensive activities in the public sphere and for his wide-ranging contribution to Israeli society and to cultural integration of Jewish communities from Islamic countries.
- The Memorial Foundation for Jewish Culture granted a fellowship to **Dr. Esther Eisenmann** for publishing the scientific edition of *Ahabah ba-Ta'anugim*, a 14th century encyclopedia of science and theology that survived only in manuscript.
- **Dr. Shaul Tzionit** received a post-doctoral fellowship from the Lady Davis Foundation.
- **Orit Hirt-Ramon** received the Lilian Mendoza Award for outstanding doctoral students in the Institute for Judaic Studies at the Hebrew University of Jerusalem.

## The Chais Research Center for the Integration of Technology in Education

The Chais Research Center is dedicated to studying the integration of technologies in teaching processes and acts to encourage research to enhance the integration of these technologies into OUI course teaching. The Center operates as a partnership among researchers from various departments, supports studies conducted by its members and grants scholarships to outstanding students pursuing advanced degrees in relevant fields. The Center also conducts ongoing academic activities in the form of conferences, symposia and research seminars.

### Research at the Chais Center in 2006-2007

- Podcasting to provide advanced literacy skills in English
- Friendship in cyberspace
- The use of computer technologies at the Open University
- Computer games as an environment for cognitive practice in adults
- The effect of a computer literacy and applications course on the use of courseware in the course "Financial Theory"
- Assessing the quality of the discussion in educational discussion groups
- The relationship between social presence and perception of learning in online discussion groups
- E-learning tools contribute to the retention of MBA students
- Social identity in online learning environments
- Course website usage patterns and their contribution to students with and without learning disabilities
- Learning and perceived learning in Skype vs. face-to-face lessons: Testing the media naturalness hypothesis
- Teachers' choice of means of communication
- Students' choice of means of communication: Testing the paradox of richness hypothesis
- Perceived learning in tutorial meetings: Does the peak-end rule apply here as well?
- The reciprocal contribution of online and face-to-face discourse in creating a teachers' professional learning community
- The value of teacher-training in a technology-rich environment
- The Plano project: A model of technology integration in a school system
- Critical reading in digital vs. print formats
- Changes over time in human digital literacy
- Making reading easy: The effect of vowelization on readability in a language with deep orthography
- Students' attitudes toward studying in an online course
- Children's perception of "behaving objects" and the effect of working with them on the development of Artificial Mind Theory
- Digital game culture in Israel and Australia
- The relationship between students' learning strategies and tactics
- Students' dialogic behavior on American university campuses
- Students' dialogic behavior at the Open University in Canada
- Students' dialogic behavior at the Open University in the UK
- The relationship between metacognitive thinking, participation and attitudes among students in an online course
- Metacognitive scaffolding by the tutor in an online teacher-training course: A case study