

Volkan Ediz

413 Morris St., Pittsburgh, PA 15218

Phone: 412-251-8526

vediz@andrew.cmu.edu

Web site: <http://www.volkanediz.com>

Education:

Ph.D. Candidate, Chemistry

Carnegie Mellon University, May 2010 (expected)

Concentrations: Computational and Physical Chemistry

M.S., Chemistry

Carnegie Mellon University, 2007

B.S., Chemistry, with University Honors

Koç University, Istanbul, Turkey, 2004

Research Experience:

Research Assistant in Theoretical Chemistry group of Dr. David Yaron, 2004-2009

Carnegie Mellon University, Department of Chemistry, Pittsburgh, PA

- Incorporation of machine learning algorithms into the ab initio quantum chemistry methods to generate a map between low and high level quantum chemical methods, allowing large calculations to be accurately done at low computational costs.
- Modeling the electronic properties of cyanine dyes used in bio-imaging: Semi-empirical quantum chemistry methods revealed a thermally activated transition from the planar to twisted geometry that could account for observed substituents effects on the fluorescence quantum yield in solution and account for the large change in quantum yield seen on binding to DNA
- Steric groups and electron donors/acceptors were used to engineer desired torsional potentials in cyanine dyes, including design of fluorogens that span multiple wavelengths and dyes that change emission wavelength when bound to an aptamer.

Research Assistant in Theoretical Chemistry group of Dr. Daniel Crawford, 2003 Summer

Virginia Polytechnic Institute, Department of Chemistry, Blacksburg, VA

- Modeling the electronic structure of α ,3-Didehydrotoluene: High-level quantum chemistry methods were used to accurately treat the biradical character of the molecule.

Research Assistant in Polymer group of Dr. Iskender Yilgor, 2000-2004

Koç University, Department of Chemistry, Istanbul, Turkey

- Synthesis of model polydimethylsiloxane and polyether based segmented polyurethane and polyurea copolymers and investigation of their structure-property relations.
- Quantum mechanical studies were used to explore the effects of hydrogen bonding on the IR spectra of metal salt doped polyurethanes, allowing structural information to be obtained from such spectra on dimethylurea blends doped with transition metal salts CoCl_2 , FeCl_3 , and LiCl .

Teaching Experience:

Teaching Assistant, 2010

Carnegie Mellon University, Pittsburgh, PA

Course: Modern Chemistry II

Held recitations and office hours, graded home works and exams

Teaching Assistant, 2006, 2007, and 2009

Carnegie Mellon University, Pittsburgh, PA

Course: Physical Chemistry (Thermo): Macroscopic Principles of Physical Chemistry

Held recitations and office hours, graded home works and exams

Teaching Experience (continued):

Laboratory Teaching Assistant, 2004 - 2006

Carnegie Mellon University, Pittsburgh, PA

Courses: Laboratory I: Introduction to Chemical Analysis, Laboratory II: Organic Synthesis and Analysis

Trained students, graded lab reports and quizzes.

Course Assistant, 2004

Carnegie Mellon University

Course: Modern Analytical Instrumentation

Graded home works and exams

Teaching Assistant, 2003 - 2004

Koç University

Courses: Physical Chemistry Lab, Instrumental Analysis Lab

Trained students, graded lab reports and quizzes.

Skills and Qualifications:

- Software development and systems integration in C++, Matlab, and Fortran, Shell Scripting
- QM/MM calculation packages (G03, Hyperchem, Ampac, Mopac, Cerius)
- Fluent in German, and Turkish (native), intermediate knowledge of Italian
- Proficient in Microsoft Office, Windows, and Unix

Awards and Honors:

- Graduate Student Teaching Award, 2009
- Summer school invitation from ICYS-ICMR in Japan, 2006
- Full scholarship from Koç University , 1999-2004
- Study trip scholarship from FIAT, 2001

Publications and Presentations:

- **Ediz, V.**, Albu, Nicolae M., Shank, N. I., Silva, G. L., Armitage, B. A., Yaron, D. Engineering of torsional potentials in conjugated organic dyes: Computational screening of dye candidates for bioimaging and a light driven molecular motor. Abstracts of Papers, 239th ACS National Meeting, San Francisco, CA, United States, March 21-25, 2010
- **Ediz, V.**, Yaron, D. J. Semiempirical quantum chemical methods based on interpolation of atomic parameters. Abstracts of Papers, 239th ACS National Meeting, San Francisco, CA, United States, March 21-25, 2010
- **Ediz, V.**, Monda, A.C., Brown, R.B., Yaron, D., Using molecular similarity to develop reliable models of chemical reactions in complex environments, [Using molecular similarity to develop reliable models of chemical reactions in complex environments](#), J. Chem. Theory Comp., 5 (12), 3175-3184, 2009
- **Ediz, V.**, Monda, A.C., Yaron, D., Using data mining algorithms to extract polarizable solvent models from quantum chemical data, Abstract of Papers, 236th ACS National Meeting, Philadelphia, PA, August 17-21, 2008
- **Ediz, V.**, Sung, W.C., Shrecengost, E., Armitage, B.A., Yaron, D., Design of fluorogenic dyes by engineering of torsional potentials via steric interactions (to be submitted to JACS)
- **Ediz, V.**, Lee, J.L., Armitage, B.A., Yaron, D., [Molecular engineering of torsional potentials in fluorogenic dyes via electronic substituent effects](#), J. Phys. Chem. A, 112 (40), 9692-9701 2008
- Yaron, D., **Ediz, V.**, Lee, J.L., Silva, G., Armitage, B.A., Computational modeling and design of fluorescent dyes for bioimaging, Abstract of Papers, 234th ACS National Meeting, Boston, MA, August 19-23, 2007
- Lee, J.L., **Ediz, V.**, Silva, G., Armitage B.A., Yaron, D., Computational modeling of cyanine dyes for bioimaging, Abstract of Papers, 234th ACS National Meeting, Boston, MA, August 19-23, 2007
- Silva, G., **Ediz, V.**, Armitage, B.A., Yaron, D., [Experimental and Computational Investigation of Unsymmetrical Cyanine Dyes: Understanding Torsionally Responsive Fluorogenic Dyes](#), J. Am. Chem. Soc., 129 (17), 5710 -5718, 2007

Publications and Presentations (continued):

- **Ediz, V.**, Yaron, D., Computational studies of excitons in carbon nanotubes, Abstract of Papers, 232nd ACS National Meeting, San Francisco, CA, August 2006
- Yilgor, I., Atilla, G. E., **Ediz, V.**, Yilgor, E., Yurtsever, E., Understanding the hydrogen bonding in polyurethanes: Quantum mechanical calculations and experimental studies on model systems, Abstract of Papers, 225th ACS National Meeting, New Orleans, LA, United States, March 23-27, 2003