

## Can Alkan

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### CONTACT INFORMATION

Department of Computer Engineering  
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### RESEARCH INTERESTS

Combinatorial algorithms for the analysis of next-generation sequencing data, genomic structural variation, human and primate segmental duplications.

### EXPERIENCE

**Department of Computer Engineering, Bilkent University**, Bilkent, Ankara, Turkey

*Assistant Professor*

**January 2012 - present**

**Department of Genome Sciences, University of Washington**, Seattle, Washington, USA

*Acting Assistant Professor*

**June 2011 - December 2011**

*Senior Fellow*

**October 2005 - May 2011**

**School of Computing Science, Simon Fraser University**, Burnaby, British Columbia, Canada

*Visiting Researcher*

**January, 2004 - September 2005**

### EDUCATION

**University of Washington**, Seattle, Washington, USA

*Department of Genome Sciences and Howard Hughes Medical Institute*

Postdoctoral Fellow, Genomics, October 2005 - December 2011

- Worked on computational methods to reconstruct the evolutionary history of alpha-satellite DNA, *de novo* alphoid sequence prediction from whole-genome shotgun sequence data, and detection of human structural variation and segmental duplications using next-generation sequencing technologies.
- Advisor: Evan E. Eichler

**Case Western Reserve University**, Cleveland, Ohio, USA

*Department of EECS*

Ph.D., Computer Science, August 2005

- Dissertation Topic: "Computational Studies on Evolution and Functionality of Genomic Repeats"
- Advisor: S. Cenk Şahinalp

**Bilkent University**, Ankara, Turkey

*Department of Computer Engineering*

B.Sc., Computer Science, May, 2000

### HONORS AND AWARDS

- TÜBİTAK Incentive Award, 2015.
- Thomson Reuters Highly Cited Researcher, 2014.
- Young Investigator Award (BAGEP), Science Academy of Turkey, 2013.
- AAAS Newcomb Cleveland Prize for the Most Outstanding Paper Published in Science, American Association for the Advancement of Science, USA, 2010.
- Case Prime Fellowship, Case Western Reserve University, Cleveland, Ohio, USA, 2000.
- Full Scholarship Awarded by Bilkent University, 1996-2000.

### PROFESSIONAL MEMBERSHIPS

- Member of the International Society for Computational Biology since 2002.

RESEARCH  
GRANTS

ACTIVE

- Scientific and Technical Research Council of Turkey (TÜBİTAK-1001-215E172), 2016-2018  
Title: Algorithms for structural variation discovery using hybrid sequencing technologies and library preparation protocols.  
Goal: Discovery and characterization of structural variants using multiple sequencing platforms, linked-reads, and read clouds.  
PI: Can Alkan
- National Institutes of Health (R01 HG006004), 2011-2016  
Title: Novel algorithms and hardware designs for ultra-fast next-gen sequence analysis.  
Goal: Developing specialized hardware architectures to accelerate mapping reads generated with the high throughput sequencing platforms.  
PI: Onur Mutlu  
Co-PI: Can Alkan
- European Union Marie Curie Actions Career Integration Grant (PCIG10-GA-2011-303772), 2012-2016  
Title: Integrated approaches for genomic variation discovery using high throughput sequencing.  
Goal: Developing novel combinatorial algorithms to comprehensively and quickly discover genomic variation.  
PI: Can Alkan
- European Molecular Biology Organization Installation Grant (IG-2521), 2013-2016  
Title: Development and application of computational methods to analyze next generation sequence data to characterize both normal and disease causing variation, and build de novo genome assemblies.  
Goal: Analysis of biological sequences generated with the next-gen sequencing platforms.  
PI: Can Alkan
- Scientific and Technical Research Council of Turkey (TÜBİTAK-1001-114Z927), 2015-2017  
Title: Characterization of Central Anatolian Neolithic populations by ancient DNA extraction and genome sequencing of individuals from Tepecik-Çiftlik (Niğde) and Çatalhöyük (Konya).  
Goal: Ancient DNA analysis of Neolithic populations. I am serving as a bioinformatics consultant for this project.  
PI: Mehmet Somel
- Scientific and Technical Research Council of Turkey (TÜBİTAK-1001-214Z130), 2015-2018  
Elucidating the mechanisms of sequential trastuzumab/T-DM1 resistance in in vitro and in vivo models of HER-2 overexpressing breast cancer.  
Goal: Unraveling molecular mechanisms of acquired T-DM1 resistance in trastuzumab resistant breast cancer models and to regain T-DM1 sensitivity. I am serving as a researcher for the bioinformatics components of this project.  
PI: Özgür Şahin
- Scientific and Technical Research Council of Turkey (TÜBİTAK-1001-115O391), 2015-2018  
Title: *de novo* genome sequencing and identification of genes involved in biotic-abiotic stress of wild beet species (*Beta Corolliflora* and *Beta Procumbens*), and cloning several genes activated in draught.  
Goal: Analysis of beet genomes. I am serving as a consultant for this project for the *de novo* assembly work package.  
PI: Ali Ergül
- Scientific and Technical Research Council of Turkey (TÜBİTAK-1001-215S364), 2015-2017  
Title: Identifying and targeting sponge long non-coding RNAs to inhibit metastasis in triple negative breast cancer using a systems biology approach.  
Goal: Delineating the mRNA-miRNA-lncRNA regulatory network controlling metastatic progression in TNBC. I am serving as a researcher for the bioinformatics components of this project.  
PI: Özgür Şahin

## PREVIOUS

- Scientific and Technical Research Council of Turkey (TÜBİTAK-1001-112E135), 2012-2016  
Title: Development and application of novel genome assembly algorithms that use multiple data sources.  
Goal: Developing assembly algorithms to more reliably construct de novo genome assemblies using data from multiple sources.  
PI: Can Alkan
- National Institutes of Health (U01 HG0052209), 2009-2012  
Title: Structural Genomic Variation Analysis for the 1000 Genomes Project.  
Goal: Develop computational methods to mine structural variation data from the 1000 Genomes. As part of the consortium, I was involved in testing paired-end read approaches to detect insertions and deletions as a postdoctoral fellow at the Eichler Lab. PI: Charles Lee

## SUPERVISED STUDENTS AND INTERNS

### CURRENT GRADUATE STUDENTS (Ph.D.)

- **Pınar Kavak:** Ph.D. student, Computer Engineering, Fall 2010 - present. Boğaziçi University, İstanbul, Turkey. Co-supervised with Tunga Güngör.
- **Shatlyk Asyralyyev:** Ph.D. student, Computer Engineering, Fall 2013 - present. Bilkent University, Ankara, Turkey. Co-supervised with Cevdet Aykanat.
- **Volkan Yazar:** Ph.D. student, Molecular Biology and Genetics, Fall 2013 - present. Bilkent University, Ankara, Turkey. Co-supervised with İhsan Gürsel.
- **Fatma Kahveci:** Ph.D. student, Computer Engineering, Fall 2014 - present. Bilkent University, Ankara, Turkey.
- **Mohammed Alser:** Ph.D. student, Computer Engineering, Fall 2014 - present. Bilkent University, Ankara, Turkey. Co-supervised with Özcan Öztürk.
- **Arda Söylev:** Ph.D. student, Computer Engineering, Fall 2014 - present. Bilkent University, Ankara, Turkey.
- **Marzieh Eslami Rasekh:** Ph.D. student, Computer Engineering, Fall 2015 - present. Bilkent University, Ankara, Turkey.

### CURRENT GRADUATE STUDENTS (M.Sc.)

- **Azita Nouri:** M.Sc. student, Computer Engineering, Spring 2014 - present. Bilkent University, Ankara, Turkey. Co-supervised with Özcan Öztürk.
- **Gülfem Demir:** M.Sc. student, Computer Engineering, Fall 2014 - present. Bilkent University, Ankara, Turkey.
- **Can Fırtına:** M.Sc. student, Computer Engineering, Fall 2015 - present. Bilkent University, Ankara, Turkey.
- **F. Tuğba Doğan:** M.Sc. student, Computer Engineering, Fall 2015 - present. Bilkent University, Ankara, Turkey.

### GRADUATE STUDENTS (ALUMNI)

- **Mustafa Korkmaz:** M.Sc., Computer Engineering, graduated in Fall 2012. Bilkent University, Ankara, Turkey. Co-supervised with Cevdet Aykanat.  
Thesis Title: “Massively parallel mapping of next generation sequence reads using GPU”  
*now: Ph.D. student at University of Waterloo.*
- **Fatma Kahveci (née Balcı):** M.Sc., Computer Engineering, graduated in Spring 2014. Bilkent University, Ankara, Turkey.  
Thesis Title: “Bias correction in finding copy number variation using read depth based methods in exome sequencing data”  
*now: Ph.D. student at Bilkent University*
- **Elif Dal:** M.Sc., Computer Engineering, graduated in Fall 2014. Bilkent University, Ankara, Turkey.  
Thesis Title: “Genome scaffolding using pooled clone sequencing”  
*now: software engineer at TÜBİTAK Software Technologies Research Institute*

- **Marzieh Eslami Rasekh:** M.Sc., Computer Engineering, graduated in Spring 2015. Bilkent University, Ankara, Turkey.  
Thesis Title: “Algorithms for the discovery of large genomic inversions using pooled clone sequencing”  
*now: Ph.D. student at Bilkent University*

#### THESIS COMMITTEES (CURRENT)

- **Arif Yılmaz:** Ph.D. candidate, Bioinformatics, since December 2012. Advisor: Yeşim Aydın Son. Middle East Technical University, Ankara, Turkey.
- **Evrin Tekeli:** Ph.D. candidate, Anthropology, since Fall 2013. Advisor: Timur Gültekin. Ankara University, Ankara, Turkey.
- **Fahrettin Can Koyuncu:** Ph.D. candidate, Computer Engineering, since Spring 2014. Advisor: Çiğdem Gündüz Demir. Bilkent University, Ankara, Turkey.
- **Abdullah Atmaca:** Ph.D. candidate, Computer Engineering, since Spring 2015. Advisors: Yavuz Oruç and Cevdet Aykanat. Bilkent University, Ankara, Turkey.

#### THESIS COMMITTEES (ALUMNI)

- **Doğukan Çağatay:** M.Sc. Computer Engineering, completed in Fall 2015. Advisor: Buğra Gedik. Bilkent University, Ankara, Turkey.
- **Gülsüm Ece Ekşi:** M.Sc. Computer Engineering, completed in Fall 2015. Advisor: Bedir Tekinerdoğan. Bilkent University, Ankara, Turkey.
- **Onur Özdemir:** M.Sc. Computer Engineering, completed in Fall 2015. Advisor: Bedir Tekinerdoğan. Bilkent University, Ankara, Turkey.
- **Daria Iakovishina:** Ph.D., Bioinformatics, completed in November 2015. Advisor: Valentina Boeva. École Polytechnique, Palaiseau, France. *now: Bioinformatician at iBinom, Moscow, Russia*
- **Yogesh Paudel:** Ph.D., Biostatistics and Informatics, completed in January 2015. Advisor: Martien A.M. Groenen. Institut für Biostatistik und Informatik in Medizin und Alternsforschung, Wageningen University, Wageningen, The Netherlands. *now: Postdoc at Roche Pharmaceuticals, Basel, Switzerland.*
- **Havva Gülay Gürbüz:** M.Sc. Computer Engineering, completed in Summer 2014. Advisor: Bedir Tekinerdoğan. Bilkent University, Ankara, Turkey. *now: Software Development Engineer at Microsoft, Redmond, WA, USA..*
- **Mehmet Başaran:** M.Sc. Computer Engineering, completed in Fall 2014. Advisor: Cevdet Aykanat. Bilkent University, Ankara, Turkey. *now: Ph.D. student at Bilkent University, Ankara, Turkey.*
- **Gülşah Merve Dal:** Ph.D., Molecular Biology and Genetics, completed in Fall 2014. Advisor: Tayfun Özçelik. Bilkent University, Ankara, Turkey. *now: Postdoctoral fellow at Department of Biology, Middle East Technical University, Ankara, Turkey.*
- **Merve Çakır:** M.Sc. Computer Engineering, completed in Spring 2013. Advisor: Uğur Doğrusöz. Bilkent University, Ankara, Turkey. *now: Ph.D. student at Duke University, Durham, NC, USA.*
- **Fahrettin Can Koyuncu:** M.Sc. Computer Engineering, completed in Fall 2012. Advisor: Çiğdem Gündüz Demir. Bilkent University, Ankara, Turkey. *now: Ph.D. student at Bilkent University, Ankara, Turkey.*
- **Özlem Tufanlı:** Ph.D. candidate, Molecular Biology and Genetics, since Fall 2013. Left the committee in Spring 2015. Advisor: Ebru Erbay. Bilkent University, Ankara, Turkey.

#### UNDERGRADUATE VOLUNTEERS (CURRENT)

- **Abdullah Alperen:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Since Spring 2015.
- **Halil İbrahim Özercan:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Since Fall 2015.
- **Mert İnan:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Since Fall 2015.
- **Ege Berkay Gülcan:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Since Fall 2015.

- **Ertuğrul Akay:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Since Fall 2015.
- **Burcu Çanakçı:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Since Fall 2015.
- **Atıl Vural:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Since Fall 2015.

#### UNDERGRADUATE VOLUNTEERS (ALUMNI)

- **Serhat Kıyak:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. 2013-2014. *now: Ph.D. student at Carnegie Mellon University.*
- **Yiğit Küçük:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. 2012-2014. *now: Ph.D. student at Case Western Reserve University.*
- **Can Koçkan:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. 2012-2014. *now: M.Sc. student at Simon Fraser University.*
- **Gülfem Demir:** B.Sc. student in Computer Engineering, Middle East Technical University, Ankara, Turkey. 2013-2014. *now: M.Sc. student at Bilkent University.*
- **Atalay Mert İleri:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. 2014. *now: Ph.D. student at MIT.*
- **Can Fırtına:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Spring 2015. *now: M.Sc. student at Bilkent University.*
- **Damla Şenol:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Spring 2015. *now: Ph.D. student at Carnegie Mellon University.*
- **Ayhun Tekat:** B.Sc. student in Computer Engineering, Bilkent University, Ankara, Turkey. Summer 2015. *now: M.Sc. student at Technische Universität München.*

#### OTHERS

- **Kerry Hall:** Intern at UW in 2006.
- **Fereydoun Hormozdiari:** Intern between February to July 2008 at UW. *now: Postdoctoral Fellow at University of Washington.*
- **Iman Hajirasouliha:** Intern UW between February to July 2009 at UW. *now: Postdoctoral Fellow at Brown University.*
- **Jacob O. Kitzman:** Rotation student at the Eichler Lab between January to April 2009. *now: Assistant Professor at University of Michigan.*
- **Peter H. Sudmant:** Ph.D. student at the Eichler Lab between May 2009 to December 2011. *now: Postdoctoral Fellow at University of Washington.*
- **Pietro D’Addabbo:** Visiting scientist at the Eichler Lab between August to November 2009. *now: Staff scientist at University of Bari.*
- **Michael Duyzend:** Rotation student at the Eichler Lab between June to August 2010. *now: Ph.D. student at University of Washington.*
- **Farhad Hormozdiari:** Research Scientist at the Eichler Lab between February to September 2010. *now: Ph.D. student at University of California, Los Angeles.*
- **Sònia Casillas:** Visiting scientist at the Eichler Lab between February to July 2011.
- **Vineet Bhakhar:** Intern between May to July 2014 at Bilkent.
- **Farnush Farhadi:** Intern between July to September 2014 at Bilkent.
- **Dilek Genç:** M.Sc. student, Computer Engineering, Fall 2015. Bilkent University, Ankara, Turkey. Left the program in Spring 2016.

#### SERVICE ACTIVITIES

#### UNIVERSITY DUTIES

- Academic Coordinator for Erasmus+ and International Exchange Programs, Department of Computer Engineering, Bilkent University, since Summer 2014.

#### EDITORIAL

- Associate Editor, BMC Bioinformatics, 2010-*present*
- PC Member, 24<sup>th</sup> Annual International Conference on Intelligent Systems for Molecular Biology (ISMB 2016), July 8-12, 2016, Orlando, FL, USA.
- PC and OC Member, 7<sup>th</sup> Conference on High Throughput Sequencing Analysis and Algorithms (HiTSeq 2016), July 8-9, 2016, Orlando, FL, USA.

- PC Member, the 3<sup>rd</sup> International Conference on Algorithms for Computational Biology (AlCoB 2016), June 21-23, 2016, Trujillo, Spain.
- PC Member, the 20<sup>th</sup> Annual International Conference on Research in Computational Molecular Biology (RECOMB 2016), April 17-21, 2016, Santa Monica, CA, USA.
- PC Member, 6<sup>th</sup> Conference on High Throughput Sequencing Analysis and Algorithms (HiTSeq 2015), July 10-11, 2015, Dublin, Ireland.
- Co-Chair, Bertinoro Computational Biology Meeting, June 14-17, 2015, Bertinoro, Italy.
- PC Member, 23<sup>rd</sup> Annual International Conference on Intelligent Systems for Molecular Biology and 14<sup>th</sup> European Conference on Computational Biology (ISMB/ECCB 2015), July 10-14, 2015, Dublin, Ireland.
- PC Member, 22<sup>nd</sup> Annual International Conference on Intelligent Systems for Molecular Biology (ISMB 2014), July 13-15, 2014, Boston, MA, USA.
- PC and OC Member, 8<sup>th</sup> International Symposium on Health Informatics and Bioinformatics, (HIBIT), September 25-27, 2013, Ankara, Turkey.
- PC Member, 21<sup>st</sup> Annual International Conference on Intelligent Systems for Molecular Biology and 12<sup>th</sup> European Conference on Computational Biology (ISMB/ECCB 2013), July 19-23, 2013, Berlin, Germany.
- PC Member, Third Annual RECOMB Workshop on Massively Parallel Sequencing (RECOMB-seq), April 11-12, 2013, Beijing, China.
- PC Member, 20<sup>th</sup> Annual International Conference on Intelligent Systems for Molecular Biology (ISMB 2012), July 15-17, 2012, Long Beach, CA, USA.
- PC Member, Second Annual RECOMB Workshop on Massively Parallel Sequencing (RECOMB-seq), April 19-20, 2012, Barcelona, Spain.
- PC Member, 19<sup>th</sup> Annual International Conference on Intelligent Systems for Molecular Biology and 10<sup>th</sup> European Conference on Computational Biology (ISMB/ECCB 2011), July 15-19, 2011, Vienna, Austria.
- Chair, First Annual RECOMB Workshop on Massively Parallel Sequencing (RECOMB-seq), March 26-27, 2011, Vancouver, BC, Canada.
- PC Member, the 15<sup>th</sup> Annual International Conference on Research in Computational Molecular Biology (RECOMB 2011), March 28-31, 2011, Vancouver, BC, Canada.
- Session Co-Chair, Session on Personal Genomics at the Pacific Symposium for Biocomputing (PSB 2011), January 3-7, 2011, The Big Island of Hawaii, USA.
- PC Member, 18<sup>th</sup> Annual International Conference on Intelligent Systems for Molecular Biology (ISMB 2010), July 9-14, 2010, Boston, MA, USA.
- Session Co-Chair, Session on Personal Genomics at the Pacific Symposium for Biocomputing (PSB 2010), January 4-8, 2010, The Big Island of Hawaii, USA.
- PC Member, The IEEE 22nd International Conference on Advanced Information Networking and Applications 2008 (AINA-08).
- PC Member, The IEEE 21st International Conference on Advanced Information Networking and Applications 2007 (AINA-07).

#### CONSORTIUM MEMBERSHIPS

- 1000 Genomes Project Structural Variation Analysis Group, 2008-2015.
- Bonobo Genome Consortium, 2008-2012.
- Orangutan Genome Consortium, 2008-2011.
- Neandertal Genome Consortium, 2009-2012.
- Gorilla Genome Consortium, 2009-2013.
- Denisovan Genome Consortium, 2010-2012.
- Great Ape Diversity Project, 2011-2014.
- Genome in a Bottle Consortium, 2015-*present*

#### AD-HOC REVIEWER

- Nature Genetics, Nucleic Acids Research, Nature Reviews Genetics, Genome Research, PLoS Genetics, PLoS Computational Biology, Nature Biotechnology, BMC Genomics, Genome Biology, Methods, Transactions of Computational Biology and Bioinformatics, Bioinformatics, Briefings in Bioinformatics, RECOMB, RECOMB-seq, SODA, FOCS, ICDE, CPM, AINA, PSB, ISMB, HiTSeq.

## TEACHING

- CS 476 Automata Theory and Formal Languages, Spring 2014, Fall 2014, Spring 2015, Fall 2015, Spring 2016.
- CS 481 Bioinformatics Algorithms, Fall 2012, Fall 2013.
- CS 319 Object Oriented Software Engineering, Summer 2012, Spring 2013, Fall 2013, Fall 2014, Fall 2015.
- CS 681 Advanced Topics in Computational Biology, Spring 2012, Spring 2013.
- CS 202 Fundamental Structures of Computer Science II, Spring 2013.
- CS 590/690 Research Topics (coordinator), Spring 2012, Spring 2014.

## SENIOR PROJECT SUPERVISION

- Espionage Game: Stealth game with adaptive artificial intelligence, 2015-2016.
- BioPeer: Secure research data sharing platform, 2014-2015.
- Coinami: Cryptocurrency mining system for scientific computation, 2014-2015.
- Anotice: Anonymized social network platform, 2014-2015.
- Touravel: Travel logging application, 2014-2015.
- SUN (Social University Network): Study group game application, 2014-2015.
- SmartVote: Electronic Voting System for Mobile Devices, 2013-2014.  
*Recipient of the Best Senior Project Award in 2014.*
- Daycept: Concept-based idea sharing platform, 2013-2014.
- Betcha: Social platform that enables betting among friends, 2013-2014.  
*Recipient of the Usability Award in 2014.*
- SocioDiary: Digital diary system, 2013-2014.
- CMPS101: Activity planning for university students, 2013-2014.
- chkDNA: Genomic variant analysis tool, 2012-2013.

## OTHER

- Member of the Scientific Advisory Board for the Center for Advanced Genomics and Bioinformatics (İGBAM) in TÜBİTAK Marmara Research Center, Gebze, Turkey. October 2012 - *present*.
- Observer to ELIXIR for Turkey. April 2013 - *present*.
- Individual Member, Global Alliance for Genomic Health. November 2014 - *present*.

## CONFERENCE AND INVITED TALKS

- Invited Speaker, **Dünyada ve Türkiye’de Genom Çalışmaları ve Biyoenformatik.** (*in Turkish*), TÜSEB 1. Türk Genom Çalıştayı, İstanbul Technical University, İstanbul, Turkey, February 12, 2016.
- Invited Speaker, **Dijital Yaşam Bilimleri.** (*in Turkish*), Gelecekhane Life 2.0 Workshop, Acıbadem University, İstanbul, Turkey, December 3, 2015.
- Invited Speaker, **A cryptocurrency with DNA Sequence Alignment as Proof-of-work.** School of Medicine, Koç University, İstanbul, Turkey, December 2, 2015.
- Invited Speaker, **Discovery of large genomic inversions using pooled clone sequencing.** SeqBio2015 Workshop, Université Paris-Sud, Orsay, France, November 27, 2015.
- Invited Speaker, **A cryptocurrency with DNA Sequence Alignment as Proof-of-work.** Middle East Technical University, Ankara, Turkey, October 21, 2015.
- Invited Speaker, **A cryptocurrency with DNA Sequence Alignment as Proof-of-work.** 9<sup>th</sup> International Symposium on Health Informatics and Bioinformatics (HIBIT 2015), Muğla, Turkey, October 16, 2015.
- Workshop Talk, **Can you really anonymize the donors of genomic data in today’s digital world?** 10<sup>th</sup> International Workshop on Data Privacy Management (DPM 2015), September 21, 2015, Vienna, Austria.
- Workshop Short Talk, **Characterization of structural variation and segmental duplications for the GiaB Project.** Genome in a Bottle Workshop, National Institute of Standards and Technology, Gaithersburg, MD, USA, August 27, 2015.
- Invited Speaker, **Discovery of large genomic inversions using pooled clone sequencing.** Georgia Institute of Technology, Atlanta, GA, USA, August 26, 2015.

- Conference Talk, **Coinami: A cryptocurrency with DNA Sequence Alignment as Proof-of-work**. High Throughput Sequencing Algorithms and Applications (HiTSeq 2015), Dublin, Ireland, July 10, 2015.
- Invited Speaker, **Discovery of large genomic inversions using pooled clone sequencing**. İzmir Biomedicine and Genome Center, Dokuz Eylül University, İzmir, Turkey, April 20, 2015.
- Invited Speaker, **High Throughput Sequencing and Bioinformatics for characterization of diseases of genomic origin**. 24<sup>th</sup> Conference of the Asian Pacific Association for the Study of the Liver (APASL 2015), İstanbul, Turkey, March 11, 2015.
- Invited Speaker, **Genetik Hastalıkların Karakterizasyonunda Yüksek Ölçekli Dizileme ve Biyoenformatik**. (*in Turkish*), İzmir Biomedicine and Genome Center, Dokuz Eylül University, İzmir, Turkey, October 8, 2014
- Invited Speaker, **Characterization of genome structural variation and large inversions using NGS**. IU Bioinformatics Clinic, July 17, 2014.
- Conference Talk, **Characterization of large inversions using pooled clone sequencing**. European Molecular Biology Organization, Young Investigator Meeting, Heidelberg, Germany, May 14-16, 2014.
- Invited Lecturer, **Characterization of mobile element insertions using NGS**. ALLBIO Course on Next Generation Sequencing (NGS) methods for identification of mutations and large structural variants, Lausanne, Switzerland, March 11-12, 2014.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. İzmir Biomedicine and Genome Center, Dokuz Eylül University, İzmir, Turkey, October 8, 2014.
- Instructor, **EMBO Practical Course: Computational biology: From genomes to cells and systems**. Cappadocia, Nevşehir, Turkey. September 29 - October 4, 2013.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. Sabancı University, Tuzla, İstanbul, Turkey. April 17, 2013.
- Invited Speaker, **Yeni nesil dizileme ile karmaşık genom yapısal farklılıkların karakterizasyonu**. (*in Turkish*), MBG Weekend Seminars VIII, Boğaziçi University, March 23, 2013.
- Invited Speaker, **Genetik Hastalıkların Keşfinde Yüksek Ölçekli Dizileme ve Biyoinformatik**. (*in Turkish*), 10<sup>th</sup> National Medical Genetics Congress, Bursa, Turkey, December 20, 2012.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. Swiss Institute of Allergy and Asthma Research (SIAF), Davos, Switzerland, September 3, 2012.
- Invited Speaker, **Characterization of mobile element insertions using high throughput sequencing**. 63rd Fujihara Seminar: A new horizon of retroposon research, Kyoto, Japan, August 2, 2012.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. School of Medicine, Koç University, İstanbul, Turkey, May 21, 2012.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. Department of Molecular Biology and Genetics, Bilkent University, Ankara, Turkey, March 14, 2012.
- Invited Speaker, **Initial analysis results of the Turkish Genome Project**. Boğaziçi University, İstanbul, Turkey, January 20-21, 2012.
- Invited Speaker, **Alu repeat discovery and characterization within human genomes**. FASEB Meeting on Mobile DNA in Mammalian Genomes, Snowmass Village, CO, USA, August 12, 2011.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. Department of Genetics, Yale University, New Haven, CT, USA, May 11, 2011.
- Invited Speaker, **Dark side of genomes: what is missing in current sequence assemblies?** Genome 10K Project Genome Assembly Workshop, Santa Cruz, CA, USA, March 16, 2011.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. Brigham and Women's Hospital, Harvard Medical School, Boston, MA, USA, February 22, 2011.
- Invited Speaker, **Next-generation sequence characterization of complex genome structural variation**. Keystone Symposium on Functional Consequences of Structural Variation in the Genome, Steamboat Springs, CO, USA, January 10, 2011.



- Tutorial Presenter, **Session tutorial: Personal Genomics**. Pacific Symposium for Biocomputing (PSB 2011), The Big Island of Hawaii, USA, January 3, 2011.
- Invited Speaker, **Discovery and characterization of copy-number variants with next-gen sequencing technologies**. TÜBİTAK Informatics and Information Security Research Center, Gebze, Turkey, August 6, 2010.
- Invited Speaker, **Characterization of novel sequence insertions through both clone-based and clone-free sequencing**. Illumina Sequencing Expert Panel Meeting, Toronto, ON, Canada, July 22, 2010.
- Tutorial Presenter, **Session tutorial: Personal Genomics**. Pacific Symposium for Biocomputing (PSB 2010), January 4, 2010, The Big Island of Hawaii, USA.
- Invited Speaker, **Structural variation discovery and characterization of segmental duplications with next-gen sequencing technologies**. Simon Fraser University, Vancouver, BC, Canada, November 19, 2009.
- Invited Speaker, **Structural variation discovery and characterization of segmental duplications with next-gen sequencing technologies**. Universitat Pompeu Fabra, Barcelona, Spain, November 16, 2009.
- Invited Speaker, **Structural variation discovery and characterization of segmental duplications with next-gen sequencing technologies**. Università di Bologna, Bologna, Italy, November 11, 2009.
- Invited Speaker, **Structural variation discovery and characterization of segmental duplications with next-gen sequencing technologies**. Università degli Studi di Bari, Bari, Italy, November 9, 2009.
- Keynote Speaker, **Structural variation discovery and characterization of segmental Duplications with next-gen sequencing technologies**. Spanish and Portuguese Bioinformatics Conference (Jornadas de Bioinformática), Lisbon, Portugal, November 6, 2009.
- Invited Speaker, **Characterization of structural variation and segmental duplications using next-gen sequencing technology**. The Mediterranean Medical Genetics Meeting 2009, Ankara, Turkey, June 30, 2009.
- Conference Talk, **Organization and evolution of primate centromeric DNA from whole genome shotgun sequence data**. 16<sup>th</sup> Annual International Conference Intelligent Systems for Molecular Biology (ISMB 2008), *Highlights Track*, Toronto, ON, Canada, July 22, 2008.
- Workshop Talk, **Personalized copy-number and segmental duplication maps using next-gen sequencing technology**. Special Interest Group on Algorithms for Short Read Assembly, Alignment & Variation Analysis at the 16<sup>th</sup> Annual International Conference Intelligent Systems for Molecular Biology (ISMB 2008), Toronto, ON, Canada, July 19, 2008.
- Invited Speaker, **Organization and evolution of primate centromeric DNA from whole genome shotgun sequence data**. Bilkent University Center for Bioinformatics, Ankara, Turkey, July 20, 2007.
- Invited Speaker, **Towards a model for the evolution of alpha-satellite DNA**. BC Genome Sciences Centre, Vancouver, BC, Canada April 12, 2006.
- Conference Talk, **RNA-RNA interaction prediction and antisense RNA target search**. Ninth Annual Conference on Research in Computational Molecular Biology (RECOMB 2005), Cambridge, MA, USA, May 14, 2005.
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**Analysis of primate genomic variation reveals a repeat-driven expansion of the human genome.** G. Liu, NISC Comparative Sequencing Program, S. Zhao, J.A. Bailey, S.C. Şahinalp, **C. Alkan**, E. Tüzün, E.D. Green, E.E. Eichler. *Genome Research*, 13(3):358-368, 2003.

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#### PEER-REVIEWED CONFERENCE PUBLICATIONS

Note: In CS disciplines papers in highly ranked conferences are fully refereed and are regarded as highly as the top journal papers. In computational molecular biology RECOMB is generally accepted as the top conference, with 10-15% acceptance rate. Joint first authors are marked with \* in case of equal contribution. Joint last authors are marked with ‡.

**Can you really anonymize the donors of genomic data in today's digital world?** M. Alser, N. Almadhoun, A. Nouri, C. Alkan<sup>‡</sup>, and E. Ayday<sup>‡</sup>. *10<sup>th</sup> International Workshop on Data Privacy Management (DPM 2015)*, September 21-22, 2015, Vienna, Austria.

**Improving genome assemblies using multi-platform sequence data.** P. Kavak, B. Ergüner, D. Üstek, B. Yüksel, M.Ş. Sağiroğlu, T. Güngör and C. Alkan. *12<sup>th</sup> Computational Intelligence methods for Bioinformatics and Biostatistics (CIBB 2015)*, September 10-12, 2015, Naples, Italy.

**Accelerating read mapping with FastHASH.** H. Xin, D. Lee, F. Hormozdiari, S. Yedkar, O. Mutlu<sup>‡</sup>, C. Alkan<sup>‡</sup>. *Proc. of the 11<sup>th</sup> Asia Pacific Bioinformatics Conference, Jan. 21-23, 2013, Vancouver, BC, Canada*

**Detection of characterization of novel sequence insertions using paired-end next-generation sequencing,** I. Hajirasouliha\*, F. Hormozdiari\*, C. Alkan\*, J.M. Kidd, I. Birol, E.E. Eichler, S.C. Sahinalp. *Proc. of the 11<sup>th</sup> Conference on High Throughput Sequencing Analysis and Algorithms, Special Interest Group of ISMB 2010 (HiTSeq 2010): July 9-10 2010, Boston, MA, USA*

**Next-generation VariationHunter: combinatorial algorithms for transposon insertion discovery.** F. Hormozdiari, I. Hajirasouliha, P. Dao, F. Hach, D. Yorukoglu, C. Alkan, E.E. Eichler, S.C. Sahinalp. *Proc. of the 18<sup>th</sup> Annual International Conference on Intelligent Systems for Molecular Biology (ISMB 2010)*, July 11-13, 2010, Boston, MA, USA

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**RNA secondary structure prediction via energy density minimization.** C. Alkan\*, E. Karakoç\*, S.C. Şahinalp, P. Unrau, H. A. Ebhardt, K. Zhang, J. Buhler. *Proc. of the Tenth Annual International Conference on Research in Computational Molecular Biology (RECOMB 2006 - LNBI 3909)*, pp. 130-142, April 2-5, 2006 Venice, Italy, 2006.

**RNA-RNA interaction prediction and antisense RNA target search.** C. Alkan, E. Karakoç, J. Nadeau, S.C. Şahinalp, K. Zhang. *Proc. of the Ninth Annual International Conference on Research in Computational Molecular Biology (RECOMB 2005 - LNBI 3500)*, pp 152-171, May 14-18, 2005 Cambridge, MA, USA, 2005.

**An algorithmic analysis of the role of unequal crossover in alpha-satellite DNA evolution.** C. Alkan, J.A. Bailey, E.E. Eichler, S.C. Şahinalp, E. Tüzün. *The 13th International Conference on Genome Informatics*, December 16-18, 2002, Tokyo, Japan, vol.18 pp 93-102, 2002.

#### UNPUBLISHED CONFERENCE TALKS AND POSTERS

**A new inference attack against kin genomic privacy.** F. Balci, H. Kulan, C. Alkan<sup>‡</sup>, and E. Ayday<sup>‡</sup>. *Privacy-aware computational genomics (PRIVAGEN 2015)*, September 8, 2015, Tokyo, Japan. *Oral and poster presentation by Fatma Balci.*

**Identifying anonymous donors of genetic information.** M. Alser, N. Almadhoun, A. Nouri, C. Alkan<sup>‡</sup>, and E. Ayday<sup>‡</sup>. *Privacy-aware computational genomics (PRIVAGEN 2015)*, September 8, 2015, Tokyo, Japan. *Poster presentation by Mohammed Alser.*

**BioPeer: A Fast and Secure Peer-to-Peer Data Sharing Tool..** C. Oge, F.T. Dogan, G. Goktepe, F. Koc, C. Sevim, C. Alkan. *The 6<sup>th</sup> Conference on High Throughput Sequencing Analysis and Algorithms (HiTSeq 2015)*, July 10-11, 2015, Dublin, Ireland. *Poster presented by Cihad Öge.*

**Coinami: A Cryptocurrency with DNA Sequence Alignment as Proof-of-work.,** A.M. İleri, H.I. Özeran, A. Gundogdu, A.K. Senol, M.Y. Ozkaya, C. Alkan. *The 6<sup>th</sup> Conference on High Throughput Sequencing Analysis and Algorithms (HiTSeq 2015)*, July 10-11, 2015, Dublin, Ireland. *Oral and poster presentation by H. İbrahim Özeran.*

**Optimal Seed Solver: Optimizing Seed Selection in Read Mapping.** H. Xin, S. Nahar, R. Zhu, J. Emmons, G. Pekhimenko, C. Kingsford, **C. Alkan**<sup>†</sup>, O. Mutlu<sup>‡</sup>. *The 6<sup>th</sup> Conference on High Throughput Sequencing Analysis and Algorithms (HiTSeq 2015)*, July 10-11, 2015, Dublin, Ireland. *Poster presentation by Hongyi Xin.*

**Discovery of large genomic inversions using pooled clone sequencing.** M.E. Rasekh, G. Chiatante, M. Miroballo, J. Tang, M. Ventura, C.T. Amemiya, E.E. Eichler, F. Antonacci<sup>‡</sup>, **C. Alkan**<sup>†</sup>. *The 6<sup>th</sup> Conference on High Throughput Sequencing Analysis and Algorithms (HiTSeq 2015)*, July 10-11, 2015, Dublin, Ireland. *Poster presentation by Marzieh Eslami Rasekh.*

**A hypergraph-based model for hybrid de novo assembly.** S. Ashyralyev, C. Firtina, C. Aykanat, **C. Alkan**. Bertinoro Computational Biology Meeting, Bertinoro, Italy, June 17, 2015. *Oral presentation by S. Ashyralyev*

**Massively Parallel Mapping of Next Generation Sequence Reads Using GPUs..** A. Nouri, R.O. Selvitopi, O. Ozturk, O. Mutlu<sup>‡</sup>, **C. Alkan**<sup>†</sup>. *The 20<sup>th</sup> International Conference on Architectural Support for Programming Languages and Operating Systems (ASPLOS 2015)*, March 14-18, 2015, İstanbul, Turkey. *Short talk and poster presented by Azita Nouri.*

#### SOFTWARE

- Multiple alignment Manipulator (MaM).  
<http://mam-bio.sourceforge.net>
- taveRNA: RNA suite for RNA folding, RNA-RNA interaction prediction and search.  
<http://compbio.cs.sfu.ca/taverna>
- micro-read Fast Alignment Search Tools (mrFAST, mrsFAST, drFAST, and sirFAST).  
<http://mrfast.sourceforge.net>, <http://mrsfast.sourceforge.net>, <http://drfast.sourceforge.net>,  
<http://sirfast.sourceforge.net>
- mrCaNaVaR: characterization of segmental duplications and absolute copy number prediction from read depth.  
<http://mrcanavar.sourceforge.net>
- VariationHunter: Structural variation calling algorithm for paired-end, next generation sequencing data.  
<http://variationhunter.sourceforge.net>
- NovelSeq: computational pipeline to detect novel sequence insertions using second generation sequencing.  
<http://novelseq.sourceforge.net>
- RepeatNet: algorithm to characterize centromeric satellite sequences from paired end sequence data.  
<http://eichlerlab.gs.washington.edu/software/repeatnet>
- SCALCE: Tool to compress FASTQ files.  
<http://scalce.sourceforge.net>