

# ALEJANDRO RIVEROS WALKER

3425 SW 2<sup>nd</sup> Ave. Apt. 262  
Gainesville, FL 32607  
United States  
(352) 231-8988  
[ariverosw@gmail.com](mailto:ariverosw@gmail.com)

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## EDUCATION

- August 2014** Ph.D. Forest Quantitative Genetics, University of Florida, Gainesville, Florida, USA  
**Dissertation title:** Genetic architecture of juvenile wood density traits in Loblolly Pine (*Pinus taeda* L.) with pedigree and genomics additive and non-additive relationship matrices
- December 2001** Forestry Engineer, Universidad de Chile, Santiago, Chile
- December 1993** B.S. Forestry Engineering, Universidad de Chile, Santiago, Chile  
Research: Physical and mechanical properties of Radiata Pine

## COMPUTATIONAL SKILLS

- Operating Systems: MacOS, Linux/Unix, OpenVMS, Windows
- Scripting Languages: R, Perl, Matlab, SAS, Linux/Unix-Shell, ASReml, Python
- Bioinformatics tools: Genome STRiP, GATK, SVseq, Softsearch, CNVnator, Samtools, BWA, BWA-MEM, Bowtie2, Mummer, Samtools-Mpileup, Celera Assembler, PBcR (PacBio corrected Reads), ABySS Assembler, Trimmomatic
- Genetic and QTL mapping tools: R-QTL, QTL cartographer
- Statistical tools: ASReml, EMMAX, SAS, R, Matlab
- R Packages: ASReml, BGLR, lme4, ggplot2 among others

## RESEARCH AND PROFESSIONAL EXPERIENCE

- November 2016** Postdoctoral Associate, Department of Biostatistics, University of Florida,  
**Until date** Gainesville, Florida

I'm working primarily as part of a team of researchers focused biostatistical methods and bioinformatics tools for analyzing medical data, specially, genomic, proteomic, multistate survival (time to event) and dental data.

### Duties

- Develop new statistical methods to solve data analysis problems from various "omics" platforms, as well as more traditional areas of biostatistics research
- Help with data analysis in collaborative scientific projects guided by the PIs
- Build statistical and informatics tools (e.g. R-packages) as directed by the PIs
- Help-mentor graduate students working under the supervision of the PIs as needed

**November 2014** Post Doctoral Fellow – Bioinformatics, Biology Department, West Virginia  
**June 2016** University, Morgantown, West Virginia

I worked primarily as a bioinformatic and statistical analyst on a multidisciplinary team that is investigating the molecular bases of heterosis in *Populus*.

- Quantitative genetic analyses of various traits in several populations of *Populus spp.*
- Association and QTL analyses of growth, chlorophyll content and light and dark-adapted chlorophyll fluorescence.
- Image analysis of wood anatomical traits from microscope images. Looking for automated measurements of vessel proportion, vessel and fiber area and cell wall dimensions.
- Genome assembly using Illumina paired-end reads, hybrid methods and/or assemblies of PacBio corrected reads.
- Development of optimized pipeline for INDELS discovery in hybrid families of *Populus spp.*

**Jan 2009** Graduate Research Assistant, University of Florida, Gainesville, Florida  
**Oct 2014**

I developed and validated computerized micro X-ray computed tomography methods for rapid measurement of wood anatomical properties for genetic analysis and experiments, including density, earlywood and latewood area and percentages, tracheid dimensions, lumen diameter, and used these methods to extensively characterize genetic architecture in southern pine using quantitative genetics and novel molecular/genomics approaches combined with Association and QTL mapping analyses.

- Quantitative genetic analyses and Association Mapping of wood traits in juvenile Loblolly Pine with ASReml and BAMD (Bayesian Association with Missing Data). Based on numerator relationship matrix and Genomics relationship matrices for additive and non-additive effects.
- QTL analysis of wood density based traits in juvenile Loblolly Pine.
- Developed SAS and R scripts to automate analysis of wood density profiles. The code identifies the transition points between earlywood and latewood to generate annual ring density, earlywood and latewood densities, latewood percentage, ring increments and earlywood and latewood increments. If wood cores start at the pith then basal area increments are calculated. The program also measures tracheid lumen area, tangential and radial tracheid dimensions, and wall thickness.
- Developed algorithm to automate strong regression equation that relates gray value in a densitometry image with density at different wood sample thicknesses.
- Correlated X-ray attenuation coefficients with wood density in 3D tomography mode.
- Developed SAS and R programs to automate the calling of false rings in a density profile.
- Developed MatLab program to automate quantification of resin canal number and area in 2D X-ray CT images
- Wood stiffness measurement analysis by ultrasound.

**Jan 2004  
Nov 2008**

Production Manager, New Home Furniture, Puerto Montt, Chile

As manager of New Home's furniture factory, I controlled production planning, manufacturing processes and shipments with emphasis on final product quality in agreement with ISO 9001-2001 definitions leading between 30-40 workers. Initially it was necessary to review and correct operation and malfunctions problems with some of the machines. I directly supervised these corrections and continued monitoring them until they were totally corrected.

- Several forms and controls were implemented that improved the quality of information about production, shipments and supply processes.
- Procedures were developed and implemented in the chain of production in agreement with ISO 9001-2001.
- Procedural and human resources were optimized to comply with master production plan.
- Production process supervision and control was in close cooperation with my seven section supervisors who controlled all technical aspects of production while I controlled final quality assessment and the termination process.
- Shipment control and logistics over final products and acquisitions.

**2001 - 2003**

Research Administration Manager, Clinica Los Andes de Puerto Montt, Puerto Montt, Chile

As head of the Research and Administration Department, I tabulated and delivered monthly activity reports with, sales, cost analysis, financial reports, market analysis, budget control, analysis and preparation with MS Access, MS Excel and SQL. I also managed the Informatics Department, main warehouse of the clinic, and all the external services including cleaning, laundry, and food and guard services. The creation of these new controls and reports was essential for negotiating an increase in capital with the general board.

- The clinic activity information was significantly improved in both number and quality of the reports. This information was presented each month to the General Manager and the Director Board. It includes neat sales, sales for area, area participations, surgery types, emergency attentions, etc.
- Setting up of the informatics system and the Internet server with a firewall and a proxy server to split the administration and Internet servers.
- Storage Centers and Informatics Office supervision.

**1997 - 2000**

Zonal Manager Sales Assistant, Compañía Cervecerías Unidas S.A., Puerto Montt, Chile

As part of a 5000-6000 people company the generation of quality information for the zonal manager in the decision making daily endeavor involved extracting information from large databases storing the sale data of the whole company. This process was done through MS Access and MySQL.

- Sales control
- Budget analysis and control
- In store supervision

- Promotional task control
- Sales control tools development

## RESEARCH PUBLICATIONS

### Published

- Hacisalihoglu, Gokhan; Gustin, Jeffery; Louisma, Jean; Armstrong, Paul; Peter, Gary; **Walker, Alejandro**; Settles, A. Mark. 2016. Enhanced single seed trait predictions in soybean and robust calibration model transfer with near infrared reflectance spectroscopy. *Journal of Agricultural and Food Chemistry Manuscript ID: jf-2015-05508s*
- Gonzalez-Benecke C. A., **Walker A. R.**, Martin T. A., Peter G. F. 2015. Automated quantification of false rings using microdensity profiles of mature *Pinus taeda* in a replicated irrigation experiment. *Trees*, 29: (1) 185-197. 10.1007/s00468-014-1103-1
- Westbrook J. W., **Walker A. R.**, Neves L. G., Munoz P., Resende M. F. R., Neale D. B., Wegrzyn J. L., Huber D. A., Kirst M., Davis J. M., Peter G. F. 2014. Discovering candidate genes that regulate resin canal number in *Pinus taeda* stems by integrating genetic analysis across environments, ages, and populations. *New Phytologist*, 205: (2) 627-641. DOI: 10.1111/nph.13074
- Westbrook J. W., Resende M. F. R. Jr., Munoz P., **Walker A. R.**, Wegrzyn J. L., Nelson C. D., Neale D. B., Kirst M., Huber D. A., Gezan S. A., Peter G. F., Davis J. M.. 2013. Association genetics of oleoresin flow in loblolly pine: discovering genes and predicting phenotype for improved resistance to bark beetles and bioenergy potential. *New Phytologist*, 199: (1) 89-100. DOI: 10.1111/nph.12240

### In Preparation

- **Walker A. R.**, Gary F. P.. X-Ray Densitometry and Tomography methods to determine density, growth and anatomic traits in wood sample analyses. Forests.
- **Walker A. R.**, Gezan S. A., Peter G. F.. Quantitative Genetics, Association Mapping and QTL Analysis of X-rays Computed Axial Tomography Phenotypes in a Loblolly Pine clonal population. Tree Genetics and Genomes.

## Presentations

- Genetic Variation and Genomic Associations of Leaf Physiological Traits in an Association Population of *Populus trichocarpa*. Jan 2016. Kori K. Ault, Steven H. Strauss, Anna C. Magnuson, Scott Kiel, H. Rose McClung, Upendra K Devisetty, Luke Evans, Hari Chhetri, Gerald A. Tuskan, Wellington Muchero, **Alejandro R. Walker**, Eli Rodgers-Melnick, Stephen DiFazio, Todd Rosenstiel. Plant & Animal Genome Conference XXIV. San Diego, CA. Poster presentation
- CGRB spring conference / Colloquium at OSU. April 2015. Upendra Kumar Devisetty, Ana Leslie Martinez, Alice Morel, Kori Ault, **Alejandro R. Walker**, Sandra Simon, Stephen Difazio, Brian Stanton, Todd Rosenstiel and Steven H. Strauss
- Genomic Science Contractors-Grantee Meeting XIII. USDA-DOE Plant Feedback Genomics for Bioenergy meeting. Feb 2015. Upendra Kumar Devisetty, Kori Ault, **Alejandro R. Walker**, Sandra Simon, Stephen Difazio, Brian Stanton, Todd Rosenstiel and Steven H. Strauss
- High Resolution X-ray Micro Computed Tomography for Genetic Analysis of Wood Traits in Loblolly Pine (*Pinus taeda* L.). June 2013. **Alejandro R. Walker**. Southern Forest Tree Improvement Conference (SFTIC). Clemson, SC. Oral presentation.

- High Resolution X-ray micro computed tomography for analysis of wood anatomy. February 2013. **Alejandro R. Walker**. IUFRO Working Group 2.02.20. Jacksonville, FL. Oral presentation.
- Genetic Variation and Control of Anatomical, Chemical and Mechanical Wood Properties of Juvenile Wood in Loblolly Pine. June 2011. **Alejandro R. Walker**. Southern Forest Tree Improvement Conference (SFTIC). Biloxi, MS. Poster presentation.

### Relevant Course Work

#### ***Major in Forest Genetics***

PCB 6555 - Quantitative Genetics  
 HOS 6932 - Molecular Markers in Plant Breeding  
 FOR 5161 - Forest Productivity & Health  
 FOR 6340 - Tree Physiology  
 FOR 6934 - Wood Properties  
 FOR 6934 - Forest Linear Models

#### ***Minor in Applied Statistics***

STA 5325 - Fundamentals of Probability  
 STA 5328 - Fundamentals of Statistical Theory  
 STA 6207 - Regression Analysis  
 STA 6208 - Basic Design & Analysis of Experiments  
 STA 6934 - Spatial Statistics  
 STA 6934 - Semiparametric Regression

### PERSONAL INFORMATION

Birth Date: September 11<sup>th</sup>

Citizenship: Chile

Civil Status: Married

Hobbies: Photography, fishing, music theory and interpretation on various instruments and movies among others

## REFERENCES

**Dr. Salvador A. Gezan, Assistant Professor**

Quantitative Genetics & Biometrics  
363 Newins-Ziegler Hall  
Gainesville, FL 32611-0410  
(352) 846-0133  
[sgezan@ufl.edu](mailto:sgezan@ufl.edu)

**Dr. Stephen P. DiFazio, Associate Professor**

Molecular ecology, Forest biotechnology and genomics  
53 Campus Dr.  
Morgantown, WV 26505  
(304) 293-5314  
[spdifazio@mail.wvu.edu](mailto:spdifazio@mail.wvu.edu)

**Dr. Gary F. Peter, Professor, Chair Advisor.**

Forest Genomics and Cell Biology  
326 Newins-Ziegler Hall  
Gainesville, FL 32611-0410  
(352) 846-0896  
[gfpeter@ufl.edu](mailto:gfpeter@ufl.edu)

**Dr. Timothy A. Martin, Professor**

Tree Physiology  
359 Newins-Ziegler Hall  
University of Florida  
Gainesville, FL 32611-0410  
(352) 846-0866  
[tamartin@ufl.edu](mailto:tamartin@ufl.edu)