Ivan Garibay

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Curriculum Vitae

July, 23, 2015

CURRENT PROFESIONAL ACTIVITIES

- Assistant professor and director of the complex adaptive systems laboratory at the Institute for Simulation and Training (IST) and researcher at the Center for Innovation and Entrepreneurship (CIE) , conducting an active and interdisciplinary research program in agent-based modeling of economic and social systems, computational models of innovation ecosystems and of innovation-driven regional economic growth, analysis of the efficacy and effectiveness of entrepreneurial support organizations (e.g. incubators, accelerators), and entrepreneurial education (e.g. Lean Launchpad training) using techniques from complex adaptive systems, network science, evolutionary computation, and artificial intelligence, in collaboration with faculty from Electrical Engineering and Computer Science, Management, Educational and Human Sciences, Mathematics, Physics, Industrial Engineering, IST, and CIE at the University of Central Florida. Directs the UCF Innovation Corps (I-Corps) program partially funded by NSF to foment entrepreneurship that will lead to the commercialization of technology that has been supported previously by NSF-funded research at Florida Universities, using the NSF I-Corps curriculum to train 32 potential startups per year.
- Directs an information technology & innovation department with over 30 employees including researchers, analysts, technologists, managers, administrators and students; and with over $2.6M of yearly operating expenditures, that oversees and architects the technology and innovation strategy for sponsored research, technology transfer, compliance, commercialization and innovation programs, research centers, and institutes; for approximately 1,900 faculty members, 160 research and commercialization professionals, and 61,000 students; and for approximately 140 million of sponsored extramural research funding per year, a portfolio of over 700 patents, and supporting over 200 potential technology startup companies per year.

AREAS OF INTEREST

Innovation ecosystems, technology diffusion and commercialization, technology startups, lean startups, regional economic growth. Agent-based computational economics, evolutionary computation, complex adaptive systems, economic modeling, computational social sciences, game theory with particular focus on (i) innovation ecosystems computational analysis and modeling; (ii) entrepreneurship education and innovation; and (iii) mathematical modeling and agent-based modeling of complex systems including co-adaptive systems, autonomous agents systems, multi-agents systems, and self-organizing systems.

BIOGRAPHICAL SKETCH

Dr. Ivan Garibay earned his Ph.D. degree at the Computer Science Department at the University of Central Florida, Orlando, where he is currently holding a joint appointment: Director for Technology and Innovation at the Office of Research and Commercialization and Assistant Professor at the Institute for Simulation and Training (IST). He received his M.Sc. in Computer Science degree also from the University of Central Florida. He earned his BS degree in Electronic Engineering in 1994 from the Ricardo Palma University. He currently

directs the UCF complex adaptive systems laboratory at IST. Dr. Garibay has twenty years of experience in consulting on computer and information systems for higher education with thirteen copyrighted enterprise software systems for research and commercialization management and administration. Dr. Garibay is a leader of the Innovation Corps movement. He is Co-PI of the NSF grant that made UCF the first and only NSF I-Corps Site in Florida and member of the NSF National Innovation Network in the research and data subcommittee. He created the framework for the I-Corps program at UCF and leads the effort as the current UCF I- Corps program director. The goal of the program is to foster entrepreneurship that leads to the commercialization of NSF-funded innovations. This program will train and nurture 96 technology startups at UCF over the next three years. Early success of this program has attracted favorable media attention. Dr. Garibay has a multidisciplinary research agenda focused on novel biologically inspired models of computation that include the fields of data analytics, big data science, evolutionary computation, artificial life, artificial intelligence, machine learning, self-organization, and its application to economic and social phenomena with focus on innovation ecosystems, economic impact of business incubators and accelerators on regional economies, entrepreneurial education and STEM education. He received the Hillman Award for excellence in PhD research from the University of Central Florida in 2003. He has organized, co-chaired and hosted many international workshops, most recently the Foundation of Genetic Algorithms international conference, FOGA (2009), the Agent-Based Modeling Conference Swarmfest (2013), and the Workshop on Data Collection, Analysis and Modeling of Nano-particle/Cell Interactions for Cancer Research (2013). Dr. Garibay is actively contributing to the creation the new Masters of Data Analytics program at UCF in collaboration with faculty from the computer science and statistics departments with the role of prospective faculty program director. He has served as a reviewer for the journal of Genetic Programming and Evolvable Machines (Springer), the Evolutionary Computation Journal (MIT), the IEEE Transactions on Evolutionary Computation (IEEE Press), IEEE Transactions on Parallel and Distributed Systems (IEEE Press), and Neural Networks Journal (Elsevier) . He has also served as a panelist for the National Science Foundation and a reviewer for the Foundation for Fundamental Research on Matter (Nederlands).

EDUCATION

Ph.D. in Computer Science, 2000-2004
School of Computer Science, University of Central Florida
Dissertation title: The Proteomics Approach to Evolutionary Computation: An Analysis of Proteome-based Location Independent Representations Based on the Proportional Genetic Algorithm.
Advisor: Dr. Annie S. Wu; External member: Dr. Kenneth A. De Jong; GPA 3.9

M.Sc. in Computer Science, 1997-2000
Computer Science Department, University of Central Florida
Thesis title: Automatic Generation of Natural Language Documentation from Statecharts.
Advisor: Dr. James Rogers; GPA 3.9

P.E. in Electronic Engineering (Título Profesional), 1995
Electronic Engineering Department, Ricardo Palma University. GPA 4.0

B.Sc. in Electronic Engineering, Highest Honors, 1990-1994
Electronic Engineering Department, Ricardo Palma University. GPA 4.0

Languages: Fluent in English and Spanish
U.S. Citizen.
Hobbies: playing piano, soccer, and reading.

EMPLOYMENT

ACADEMIC

- **Assistant Research Professor**, June 2013 - Present, Institute for Simulation and Training, University of Central Florida
- **Joint Faculty** , August 2014 - Present, Electrical Engineering & Computer Science Department, University of Central Florida
- **Joint Faculty**, January 2014 - Present, Center for Innovation & Entrepreneurship
- **Joint Faculty**, 2012-2013, Institute for Simulation and Training, University of Central Florida
- **Joint Faculty**, 2006-2013, School (now Department) of Electrical Engineering and Computer Science, University of Central Florida.
- **Lecturer**, 1995-1997, Electronic Engineering Department, Ricardo Palma University.

INDUSTRY: INFORMATION TECHNOLOGY for HIGHER EDUCATION

- **Director of Technology & Innovation and Chief Information Officer for VP for Research**, 2015-Present, University of Central Florida.
  - In charge of all technology infrastructure and enterprise solutions for the research and commercialization division
  - Oversee all aspects and provide strategy for technology and innovation.
  - Directs, provides strategy and executive leadership for UCF Innovation Corps program for the Center for Innovation and Entrepreneurship
  - Supports initiatives like the APLU-CICEP (Association of Public and Land-Grant Universities Commission on Innovation, Competitiveness, and Economic Prosperity) that resulted in UCF winning the APLU-CICEP Inaugural Economic Prosperity University (IEPA) award
  - Provided economic impact analysis studies and reports for: UCF Business Incubation Program, Grow FL Program, and Florida High Technology Corridor Counsel
  - Supervise researchers, technologists, data and economic analysts, program managers, associate directors, coordinators, program managers, administrators, students and all technical personnel including programmers, software engineers, systems analysts, business analysts, system administrators, help desk manager and end user support specialists.
  - Architect and deliver the following strategic technology services:
    * Enterprise research application development and support
    * Enterprise University knowledge management, research reporting and data analytics and business intelligence
    * Third-party enterprise solution configuration, administration and integration including Salesforce and PeopleSoft
    * System and database administration, data warehousing
    * Datacenter infrastructure, data backup and disaster recovery solutions
    * Website solutions: hosting, development and management
    * End-user support and help desk services
  - Directly provides support, systems, and services for the following UCF units: Office of the VP for Research and Commercialization, the Center for Innovation and Entrepreneurship, the Contracts and Grants Office, the Compliance Office, Animal Subjects Office, Human Subjects Office, the Proposal Development Office, the UCF Research Foundation, the Office of the ORC-CFO, the ORC General Counsel Office, the Technology Transfer Office, the Business Incubation Program

(11 locations across Florida), the UCF Venture Accelerator, the Florida Angel Nexus and the Nano Science Technology Center. Indirectly supports all other Institutes and Centers under the VP for research.

- Provided software engineering, architecting, maintenance, infrastructure, project management and business analysis support for 18 ERP enterprise research administration and management systems. 13 of these systems were architected and developed by the RIS software development group and are currently maintained and upgraded by RIS. For software systems developed externally, RIS manages the external provider contractual obligations, provides database support, middleware support, and support for the integration all these systems with other ERP university systems like PeopleSoft (Financials, Human Resources, etc.) and Shibboleth (federated identity solution).
- Resposible for technology infrastructure including two 24/7 datacenters in support of RIS services and operations: infrastructure architecture, system administration, support contracts, backup contracts, database administration, virtual server administration, ERP ORC systems management (enterprise systems servicing all UCF research community), web servers, etc. Main ORC-RIS Datacenter located at University Towers 5th Floor with approximately 50 physical/virtual servers in our production environment and 14 in our development environment, and 150 Terabytes in production storage. This datacenter supports approximately 170 databases. Disaster recovery data center mirrors pro- duction data center.
- Work with external higer education consultants to coordinate system implementation, integration and continuous support for five enterprise research administration and management systems
- Responsible for technology services managed by the RIS Service desk. Service desk process approximately 7,000 service tickets per year. Services offered via the RIS service desk include computer support, server support, websites support, system administration, and enterprise user system support.

- **Director of Research Information System Department and Chief Information Officer for the Research Division**, 2009-2015, University of Central Florida.
- **Associate Director and Chief Information Officer**, 2006-2009, Office of Research and Commercialization, University of Central Florida.
- **Lead Systems Programmer and Architect**, 2002-2006, Office of Research and Commercialization, University of Central Florida.
- **Assistant Director**, 1996-1997, Computer Services, Ricardo Palma University.
- **CTO and Co-founder**, 1995-1997, Lantech, Srl., an information technology services company.

FUNDED RESEARCH & PROJECTS

FEDERAL FUNDING

Agency:	National Science Foundation (NSF), Co-PI, NSF CNS: 1347356
Title:	University of Central Florida I-Corps Sites Program: Enhancing technology commercialization at a world-class innovation ecosystem
Role:	Co-PI, conceived idea, main writer, assemble team, program director, curriculum developer
Period:	May 2014—May 2017
Amount:	**$300,000 (IG: $60,000)**

STATE FUNDING

Agency:	Florida Board of Governors (internal sub award), PI
Title:	Data Analytics to Support : CSIT (UCF-USF-FIU) TEAm Grant: An Urban University Coalition Response to Florida's Computer and Information Technology Workforce Needs
Role:	PI (internal sub award)
Period:	Jan 2015—Jan 2016
Amount:	**$25,000**

CONTRIBUTION TOWARDS FEDERAL FUNDING

Agency:	Department of Commerce (DoC), Key Personnel, DOC EDA
Title:	Make Spaces I-Corps Proof of Concept Center
Role:	Key Personnel, contributed to the main idea of the grant: build on I-Corps success
Period:	April 2015—March 2018
Amount:	**$500,000** (Match: **$500,000**) (IG: —)

Agency:	Department of Commerce (DoC), Key Personnel, DOC EDA
Title:	StarterCorps Seed
Role:	Key Personnel, contributed to the main idea of the grant: seed funds for I-Corps graduates
Period:	April 2015—March 2017
Amount:	**$250,000** (Match: **$250,000**) (IG: —)

PENDING FUNDING

Agency:	National Science Foundation (NSF), Co-PI
Title:	Enhancing STEM Employability through the "Pathways to Leadership" Program
Role:	Co-PI,
Amount:	**$599,793 (IG: $100,000)**

Agency:	National Science Foundation (NSF), Co-PI
Title:	Innovation Corps - Regional Node Program (I-Corps Node): Florida Regional Innovation Node (FRIN)(ID: 1057227)
Role:	Co-PI, help to orchestrated the three-university partnership, proposal writer and contact for UCF, organized collaborators for UCF to lead the research component of the grant
Amount:	**$3,750,000 (IG: $250,000)**

OTHER SIGNIFICANT ACHIEVEMENTS

Agency:	Florida Board of Governors (Co-author Gary Leavens)
Title:	New Degree Program Proposal: **Masters degree in Data Analytics**
Status:	under review

Agency:	Florida Board of Governors (Co-author Gary Leavens)
Title:	Market Tuition Rates Proposal: **Masters degree in Data Analytics**
Status:	under review

RESEARCH PROJECTS

UCF I-Corps Program

Directs the UCF I-Corps program working with the UCF I-Corps Executive Director and UCF VP, Thomas O'Neal and the Office of Research and Commercialization staff assigned to this program. UCF I-Corps is partially funded by the National Science Foundation "I-Corps Sites" grant ($300,000) and by two Department of Commerce, Economic Development Administration, i6 Regional Innovation Grants for the Maker Spaces I-Corps Proof of Concept Center ($750,000 + $750,000 match), and for creation of a I-Corps seed capital fund ($250,000 + $250,000). In the process of establishign the Florida Innovation Network to expand the I-Corps program to all Florida in collaboration with University of Florida, University of South Florida, Florida State University and Florida International University.

The University of Central Florida (UCF) is a leader in research, innovation and commercialization. In the last ten years, UCFs 12 colleges and 9 multidisciplinary research centers received over $1.12 billion dollars in research funding. In 2012 UCF was ranked among the top 20 internationally by the IEEE for the power of patents earned, and in 2013 the UCF Business Incubation Program was named the Incubator Network of the Year by the National Business Incubation Association. UCF has a vibrant entrepreneurship ecosystem in support of technology entrepreneurs that translate discoveries and innovations into business ventures and economic growth. **The goal** of the UCF I-Corps Sites program is to enhance the transition of UCF research into the marketplace and to increase the number of I-Corps teams, ventures, and spin-off companies resulting from NSF funded research. The UCF I-Corps Sites program will enable the university to expand its entrepreneurship offerings to reach additional prospective and under-represented participants and to realign its entrepreneurship programming across campus in order to create a steady supply of entrepreneurial teams for the NSF I-Corps program. The UCF I-Corps Sites program will provide entrepreneurial services to approximately 32 teams per year and consist of the following elements: **(1) Recruiting and selecting** technology entrepreneurial teams across Florida consisting of a faculty, a student and a mentor. **(2) Teaching** the I-Corps curriculum of evidence-based entrepreneurship. **(3) Support** the graduated teams in coordination with the UCF Venture Accelerator and the Florida Angel Network.

The Intellectual Merits include increasing our understanding of the practices of entrepreneurial education and transitioning university research into the marketplace in order to continuously improve our processes, methodologies and programs. The impact of these practices will be analyzed by tracking data over time and monitoring the effects of education and entrepreneurial services on the increase of technology commercialization. In addition, the data collected will be used to conduct transformational research to further our understanding on how to build stronger and more resilient innovation ecosystems using methodologies from complexity economics and network sciences.

The broader impact is that the University of Central Florida I-Corps program serves to enhance and strengthen Central Floridas growing and dynamic innovation ecosystem, contributing greatly towards the development of a stronger national ecosystem. UCF is Central Floridas innovation engine for the well-established high-technology cluster that includes the Institute for Simulation and Training, NASA, DOD, Disney, Universal Studios, and AE Games. UCF is also the anchor for the relatively new medial cluster at Lake Nonas Medical City that includes the UCF Health Sciences Campus, the Sanford-Burnham Medical Research Institute, and MD Anderson Orlando Cancer Research Institute. UCF is an active leader and an engaged partner in the Central Florida innovation ecosystem. UCF continuously aligns quality educational programs and strives for global leadership in selected areas of research that directly impacts existing and emerging industry clusters in the region. UCF cultivates new and nurtures existing partnerships that bring together businesses, academia, research centers and communities to jointly deliver societal benefits such as high-value job creation and economic growth for our region.

Sonet-math: Improving STEM education using a participatory, social and collaborative architecture for learning

This research focuses on understanding the most effective ways to use information technologies for STEM undergraduate education. We have partnered with the Mathematics department and focused on Calculus I and II classes. We currenly have two sub projects: DISCUZZ and SONET. The Discuzz project is a partnership with Microsoft Corporation to use their emerging social networking technologies (Discuzz system)

in a Calculus II class in the Summer 2012 and use the other five Calculus II sections as control group. We are also partnering with the sociology deparment (Dr. Amanda Anthony) to collect the data for this study. DISCUZZ increased the success rate of students by 19%. The average number of students obtaining a grade of B or better in Calculus II in the years of 2010 and 2011 is 35%, while in the DISCUZZ (SONET-MATH) pilot 54% of students obtained a grade of B or better. We are currently developing the PASCAL (PArticipatory Social Collaborative Architecture for Learning) platform to conduct further studies for the SONET-MATH (SOcial NETworking for MATHematics) program that will start next Fall 2013 (depending on funding). This program will implement a sustainable model of first recruiting STEM students to take social-media-enhanced math courses (Calculus I and II) during their freshman year and then enhancing their student learning of important math concepts. Their improved performance in these gateway math courses will positively influence them to persist and excel in STEM and eventually become successful scientists and engineers. SONET-MATH is a partnership that brings together 7 faculty from two STEM Colleges at UCF (College of Engineering and Computer Science, College of Sciences), the College of Education with PEER (Program Evaluation and Educational Research) Group, and a number of UCF offices, Institutional Research (IR), Faculty Center for Teaching and Learning (FCTL), First Year Advising (FYA), Admissions Office, Marketing Office) to achieve the projects goal of increasing STEM student learning in the important math freshman gateway courses of Calculus I and Calculus II.

Econosim: A novel approach for modeling innovation-based economic growth using computational agents and adaptive resource transformers

Agent-based computational economics (ACE) has increased in popularity over the past few years as a tool to both understand and explain complex economic phenomenon. Econosim is a new ACE model being developed at the University of Central Florida. It differs from many existing ACE models by removing the distinction between firms and households. In Econosim, every economic agent is both a consumer and a producer. This decision results in production and trade becoming the core economic behaviors of every economic agent and allows the system to self-organize into networks of production and consumption. In addition, we explicitly represent production knowledge as a set of resource transformation rules that are subject to evolutionary forces. This representation allows population dynamics to alter the technological landscape of the economy and provides a straightforward method of exploring innovation and knowledge driven economic growth. Each agent in our model, called an adaptive resource transformer (ART), lives within an economic ecosystem where individuals are connected by social networks and the actions of an agent can have unintended consequences beyond its nearest neighbors. Econosim is intended to serve as a computational economics laboratory that can be used to verify and explore existing economic ideas and theories, and help inspire and create new ones. It is also intended to serve as a tool for exploring the impact of economic policy by allowing modelers to view the potential consequences of their decisions in silico, before they are enacted in the real world. The current model is written in Java, using the MASON toolkit. It is being employed to explore the benefits of entrepreneurial support organizations, such as university incubators, and

Complexity Economics Modeling of Retirement Systems

This project, conducted jointly by the University of North Carolina Charlotte (UNCC), the University of Central Florida (UCF), the University of Torino (Italy) and the Sarajevo School of Science and Technology (Bosnia-Hersegovina), under the direction of Mirsad Hadzikadic, PI, Pietro Terna, Co-PI, Ivan Garibay, Co-PI, Adisa Arapovic, Co-PI, Ted Carmichael, Co-PI, Mateo Morini, Co-PI, and Ozlem Garibay, Co-PI, proposed to address the implications of financial literacy on the financial well-being of retirees using novel computational modeling paradigms to expand and complement existing retirement models. The recent financial crisis has prompted a reconsideration of some of the most fundamental assumptions made by widely used mainstream macroeconomic models and lead to a renewed interest on alternative economic modeling that can accommodate more realistic sets of assumptions. In contrast with traditional models, these emerging paradigms strive to take into account the inherent complexity, nonlinearity and structure of economic interactions; the heterogeneity and bounded rationality of economic agents; and the possibility of far from equilibrium dynamics in the resulting systems. Some such approaches are coalescing under the name complexity economics and advocate tools such as agent-based computational modeling and network science analysis that have been proven successful in the study of other complex systems such as ecosystems,

epidemics, and climate. While the focus of undergoing efforts in complexity economics is on fixing the problems in the Wall Streets of the world, we propose instead to focus on an economic issue not currently well understood and that directly affects every household on Main Street: retirement well-being.

MEDIA COVERAGE

NSF Innovation-Corps Program at UCF

1. WOFL TV News Coverage: Startup Bootcamp Kickoff; interviews with program director and teams. February 3, 2015/in Featured on Home, News, News Coverage, Videos / https://icorps.cie.ucf.edu/wofl-startup-boot-camp/

2. Debowe, Kim. (2015 March 31) UCF Awarded Commerce Grants for Entrepreneurship. *Forward Florida* Available online at: forwardflorida.com

3. Lebellot, Ailin. (2015, March 30) UCF awarded up to $750,000 in grants to help local entrepreneurs. *Orlando Business Journal* Available online at: http://www.orlandosentinel.com/technology

4. Richardson, M. (2015, February 11) 8 things in development at UCF's tech accelerator. *Orlando Business Journal* Available online at: http://www.bizjournals.com/orlando/news

5. Santana, M. (2015, January 30) Orlando must work to keep "recognizable icons" of city's tech community, says Silicon Valley entrepreneur. *Orlando Sentinel* Available online at: http://www.orlandosentinel.com/technology

6. Richardson, M. (2015, January 30) Silicon Valley entrepreneur: Orlando tech scene has all th Ingredients to be great.*Orlando Business Journal* Available online at: http://www.bizjournals.com/orlando/news

7. Brinkman, P. (2015, January 26) UCF seeks expanded entrepreneur program Available online at: http://www.orlandosentinel.com/technology

8. Brinkman, P. (2015, January 22)) UCF embraces I-Corps to bring innovation to market faster. *Orlando Sentinel* Available online at: http://www.orlandosentinel.com/business/brinkman-on-business.

9. **Garibay, I.** (2015) UCF I-Corps Welcomes Co-Founder and Pioneer of Lean Startup Movement. Available online at: http://www.streetinsider.com

10. **Garibay, I.** (2015) UCF I-Corps Welcomes Co-Founder and Pioneer of Lean Startup Movement. *Cloud Computing* Available online at: http://cloud-computing.tmcnet.com/news

11. **Garibay, I.** (2015) UCF I-Corps Welcomes Co-Founder and Pioneer of Lean Startup Movement: Jerry Engel Set to Visit Orlando. *Rock Hill Herald.* Available online at: http://www.heraldonline.com

12. Santana, M. (2014, December 31) Entrepreneurial leader to visit Orlando. *Orlando Sentinel* Available online at: http://www.orlandosentinel.com/business/technology.

13. **Garibay, I.** (2013). Workshop Explores Nanoparticle, Cell Interactions for Cancer Research - UCF Today (UCF Newspaper). Available online at: https://today.ucf.edu/workshop-explores-nanoparticle-cell-interactions-for-cancer-research

14. Judsen, S. (2013, October 31). UCF works toward chemo alternative. *Central Florida Future*, p. A6. Available online at: http://www.centralfloridafuture.com/

15. **Garibay, I.** (2015) UCF I-Corps Now Recruiting Scientists and Engineers to Apply to Participate in Fall Program. Available online at: `http://www.streetinsider.com/Press+Releases/UCF+I-Corps+Now+Recruiting+Scientists+and+Engineers+to+Apply+to+Participate+in+Fall+Program/10583466.html`

INSTRUCTION EXPERIENCE, INTEREST and PLANS

FACULTY DEVELOPMENT

UNDER THE NATIONAL SCIENCE FOUNDATION I-CORPS PROGRAM

- I-Corps: Evidence-Based Entrepreneurship (co-teach) Fall 2015
  - review curriculum , developed "Talking to Humans" module based on *Talking to Humans Success starts with understanding your customers* by Giff Constable, et.al.
- I-Corps: Evidence-Based Entrepreneurship Spring 2015
  - Accredited as NSF National I-Corps Faculty
  - Adapted curriculum from *T*he Lean LaunchPad: Evidence Based Entrepreneurship.
  - Course offered to selected teams of Florida faculty, students and mentors
  - Textbooks: *Startup Owner's Manual* by Blanks and Dorf, *Business Model Generationi* by Osterwalder, et.al.

GRADUATE INSTRUCTION

- **Simulating Innovation** Summer 2015
  - IDS6908. Independent study. Textbooks: *Simulating Innovation: Computer-based tools for Rethinking Innovation* by Christopher Watts and Nigel Gilbert.
- **Complex Adaptive Systems** Fall 2012
  - CAP6675. Adjusted curriculum.
- **Complex Adaptive Systems** Fall 2011
  - CAP6675. Developed new curriculum. Textbooks: *Complexity: A guided Tour* by Melanie Mitchell, *Complex and Adaptive Dynamical Systems* by Claudius Gros, and *The Computational Beauty of Nature: computer explorations of fractals, chaos, complex systems, and adaptation* by Gary William Flake.
- **Evolutionary Computation** Spring 2007
  - CAP5512. Developed Curriculum. Textbook: *Evolutionary Computation: A Unified Approach* by K. De Jong.

UNDERGRADUATE INSTRUCTION

- Current Topics in Machine Learning II (co-teach) Spring 2011,
  EEL4817. Agent-Based Computational Economics.
- Current Topics in Machine Learning I Fall 2010
  EEL4818. Genetic Algorithms
- Current Topics in Machine Learning II Spring 2010
  EEL4817.
- Current Topics in Machine Learning I Fall 2009
  EEL4818. Genetic Algorithms
- Current Topics in Machine Learning II Spring 2009
  EEL4817.
- Current Topics in Machine Learning I Fall 2008
  EEL4818. Genetic Algorithms

- Current Topics in Machine Learning II Spring 2008
  EEL4817.
- Current Topics in Machine Learning I Fall 2007
  EEL4818. Coevolution and Evolutionary Game Theory
- Current Topics in Machine Learning II Spring 2007
  EEL4817.
- Current Topics in Machine Learning I Fall 2006
  EEL4818. Genetic Algorithms.
  EEL4817 and EEL4818 are part of an NSF funded project for Combined Research and Curriculum Development in Machine Learning at UCF (Michael Georgiopoulos, PI).
- Introduction to Digital Systems Fall 1995
- Introduction to Computer Science Spring 1996
- Foundations on Arithmetic and Logic Fall 1996
- Introduction to Digital Systems Spring 1997

STUDENT SUPERVISION

- **Ph.D. Supervision** (co-supervised) Fahad Khan (EECS), Gene Sher (EECS)
- **Masters Supervision**: Esin Soyler (IST, graduates 2015), Prateek Basevaraj (EECS, graduates 2015)
- **In Ph.D. dissertation committee**
  - Brent Horine (2013) - Bootstrapping Cognitive Radio Networks
  - Mahsa Maghami (2013) - Identifying influential agents in social systems
  - Vernet Lasrado (2011) - Design of the layout of a manufacturing facility with a closed loop conveyor with shortcuts using queueing theory and genetic algorithms
  - Robert L. Porter (2010) - Competitive Actions Of Emerging Technology Firms In Innovation Ecosystems: The Red Queen Effect And Emerging Firm Performance
  - Vernet Lasrado (2011) - Design of the layout of a manufacturing facility with a closed loop conveyor with shortcuts using queueing theory and genetic algorithms
  - Phillips Verbancsics (2010) - Effective Task Transfer through Indirect Encoding
  - Saad Khan (2008) - Taming Crowded Visual Scenes
  - Ashok Khanal (in progress)
- **Graduate Research Assistants supervision**: Brian McQuay, Scott Russell, Douglas Lother, David Bracewell, Kivanc Oner, Baris Caglar, Pankaj Gupta, Guoqiang Wang, Shafaq Chaudhry, Alexander Aved, Bilal Orhan, Ilhan Akbas, Chris Hollander, David Ellis, Amit Goel, Yevgeniy "Gene" Sher, Fahad Khan, Gurkan Solmaz, Rouhollah Rahmatizadeh, Raghu Avula, Fahad Khan, Hamid Izadi Nia, Mohd. Zubair Ahmad, Esin Soyler, Prateek Basavaraj, Vinay Chander , Sudeep Agarwal , and Priyeshkumar Wani
- **In Honors Thesis committee**: Matthew Falanga (2009)
- **RAMP scholarship Faculty Mentor**: Nate Enos (2012-2013)
  Supervise undergraduate student on a for two years of funded research. Topic: Understanding the Balance between Economic Equality and Economic Growth: A Generative Computational Approach
- **UCF Technology and Innovation Intership Program** (2014- present)
  - Establish intership program at the UCF Office of Technology and Innovation
  - Recruits undergraduates and high school students to intern and learn about research in complex systems, information technology, and information systems for higher education.

- Himan Patel Fall 2014 [Aug - Dec] UCF Information Technology
- Robert Robinson Spring 2015 [Jan 15 May 15] Lake Brantley High Schol Computer Science
- Doug S Hague Spring 2015 [Jan 15 May 15] Oviedo High School Computer Science
- John Lynch Summer 2015 [June 8 Aug 8] Oviedo High School Computer Science
- Gabrielle Pinsky Summer 2015 [June 8 Aug 8] Lyman High School Engineering
- Christian Coates Spring 2015 [Jan 15 May 15] Grooms High School Information Technology
- Jacob Coates Summer 2015 [June 8 Aug 8] Grooms High School Information Technology
- Kristian Martinez Summer 2015 (June 8 - UCF Computer Science
- Lucas Ceballos Summer 2015 (June 8 - UCF Computer Science
- Vanessa Prince Spring 2015 [Jan 15 May 15] UCF Computer Science

HONORS

- **Affiliate Professor and Advisor to the President**, Ricardo Palma University, Lima, Peru (2006-present)
- **Best Paper Award Nomination**, Genetic and Evolutionary Computation Conference, Washington, DC, USA (2005).
- **Hillman Fellowship Award** for excellence in Ph.D. research, University of Central Florida, Orlando FL, USA (2003)

PROFESSIONAL ASSOCIATIONS

AEA	American Economic Association since 2013
CSSSA	Computation Social Science Society of the Americas since 2013
ESSA	European Social Simulation Association since 2012
T2S	Technology Transfer Society since 2012
AAAI	American Association for Artificial Intelligence since 2003
IEEE	Institute of Electrical and Electronics Engineers since 2000
ACM	Association for Computing Machinery (ACM) since 2006
SIGEVO	ACM Special Interest Group on Genetic and Evolutionary Computation since 2006
AAAS	American Association for the Advancement of Science since 2002.

TECHNICAL EXPERIENCE

TECHNICAL REVIEWING

Journals

- Evolutionary Computation Journal (MIT Press)
- Genetic Programming and Evolvable Machines Journal (Springer)
- IEEE Transactions on Evolutionary Computation (IEEE Press)
- IEEE Transactions on Parallel and Distributed Systems (IEEE Press)
- Neural Networks Journal (Elsevier).

Journal Editorship (especial edition invited)

- Foundation of Genetic Algorithms, Special Editor for 2009

Proceedings

- International Conference on Simulation and Modeling Methodologies, Technologies and Applications SIMULTECH (2016)
- Computation Social Science Society of the Americas Conference CSSSA (2015)
- ISIT 2015, 6th International Symposium on Innovation and Technology (2015)
- GECCO 2014, Genetic and Evolutionary Computation Conference, genetic algorithms track (2014)
- ISIT 2015, 5th International Symposium on Innovation and Technology (2014)
- ISIT 2013, 4th International Symposium on Innovation and Technology (2013)
- SwarmFest 2013, 17th Swarm Development Group 's Agent-Based Modeling Conference (2013),
- ISIT 2012, 3nd International Symposium on Innovation and Technology (2012),
- ISIT 2011, 2nd International Symposium on Innovation and Technology (2011),
- GECCO 2010, Genetic and Evolutionary Computation Conference, generative and developmental systems track (2010),
- ISIT 2011, 1st International Symposium on Innovation and Technology (2010),
- GECCO 2009, Genetic and Evolutionary Computation Conference, generative and developmental systems track (2009),
- FOGA 2009, Foundations of Genetic Algorithms (2009),
- GECCO 2008 generative and developmental systems track (2008),
- 2008 IEEE World Congress on Computational Intelligence (WCCI 2008),
- GECCO 2007 generative and developmental systems track (2007),
- GECCO 2006 genetic programming track (2006),
- GECCO 2006 Workshop on Complexity through Development and Self-organizing Representations (2006),
- GECCO 2005 Self-organization in Representations workshop (2005),
- GECCO 2004 self-organization in Representations workshop (2004),
- European Conference on Artificial Life, ECAlife, (2005),
- Ninth International Conference on the Simulation and Synthesis of Living Systems, ALIFE09, Workshop on Self-Organization and Development in Artificial and Natural Systems (2004),
- GECCO 2004 genetic algorithms track (2003),
- GECCO 2003 genetic algorithms track (2002).

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- IQ Orlando: Accelerating Live Sciences System, ©2015 UCF (to be submitted)
- SUPER: workflow-based web system for researchers ©2014 UCF (to be submitted)
- Secure Docs: lets faculty and researchers access protected content ©2014 UCF (to be submitted)
- Business Incubation Management System ©2014 UCF (to be submitted)
- Young Entrepreneur and Scholar Scholarship System ©2013 UCF (to be submitted)
- Florida Angel Nexus: Angel Investor Network Management System ©2012 UCF (to be submitted)
- APAS: Institutional Animal Care and Use Committee Management System ©2012 UCF (to be submitted)
- Institutional Review Board and Regulations Compliance Management System ©2005 UCF
- A University Resources On-Line Reporting Application: AURORA ©2004 UCF

- Intellectual Property Management System: Intel-Pro ©2003 UCF
- Personal Access to the office of Research Information Systems: PARIS ©2003 UCF
- Digital Documents Storage and Retrieval System: TeraServer ©2002 UCF

PROPOSAL REVIEWER and PANELIST FOR FEDERAL AGENCIES

- **NSF Panelist**: Invited by NSF to particiapte as panelist for the Innovation Corps Sites program. Review proposals and participated on the dicussion to make funding recommendations.
- **Reviewer for FOAM**: Review one proposal for the Foundation for Fundamental Research on Matter (FOM), the largest government-supported physics organization in the Netherlands.

CONFERENCE ORGANIZER and CHAIRMAN

- **Technical Committee Chair**: 6th International Symposium of Innovation and Technology, ISIT2015, Mar del Plata - Argentina, August 13-14, 2015.
- **Technical Committee Chair**: 5th International Symposium of Innovation and Technology, ISIT2014, Salamanca-Guanajuato. Mexico, October 20-22, 2014.
- **Technical Committee Chair**: 4th International Symposium of Innovation and Technology, ISIT2013, Urubamba-Cusco, Peru, November 25-27, 2013.
- **Chair, Organizer**: Workshop on Data Collection, Analysis and Modeling of Nano-particle/Cell Interactions for Cancer Research, Orlando FL, October 11, 2013.
- **Chair, Organizer**: Swarmfest 2013, 17th Swarm Development Group's Agent-Based Modeling Workshop, Orlando FL, July 8-9, 2013.
- **Co-General Chair**: ISIT 2012, 3rd International Symposium on Innovation and Technology. Cusco Peru, November 26-28, 2012.
- **Special Sessions Chair**: ISIT 2011, 2nd International Symposium on Innovation and Technology. Lima Peru, November 28-30, 2011.
- **Technical Program Co-Chair**: ISIT 2010, 1st International Symposium on Innovation and Technology. Ica Peru, November 29 - December 1, 2010.
- **Co-Chair**: FOGA X : Foundations of Genetic Algorithms. Sponsored by ACM SIGEVO. Orlando, Florida USA, January 9-11, 2009.
- **Co-Chair**: Complexity through Development and Self-Organizing Representations workshop. Part of Genetic and Evolutionary Computation Conference (GECCO-2006), Seattle, Washington, USA, July 8-12, 2006.
- **Co-Chair**: Second Workshop on Self-organization in Representations for Evolutionary Algorithms: Building complexity from simplicity. Part of Genetic and Evolutionary Computation Conference (GECCO-2005), Washington, D.C., USA, Jun 26, 2005.
- **Chair**: Workshop on Self-organization in Representations for Evolutionary Algorithms. Part of Genetic and Evolutionary Computation Conference (GECCO-2004), Seattle, Washington, USA, Jun 27, 2004.

COMMUNITY SERVICE

- Judge for the Park Maithland School Science Fair, Orlando Science Center 2015
- Judge for the Park Maithland School Science Fair, Orlando Science Center 2014

COLLABORATORS

Jerome Engel (Berkeley), Pietro Terna (University of Torino, Italy), Mateo Morini (Ecole normale suprieure de Lyon, France), Mirsad Hadzikadic (University of North Carolina Charlotte - UNCC), Ted Carmichael (UNCC), Adisa Arapovic (Sarajevo School of Science and Technology, Bosnia-Hersegovina), Doyne Farmer (Oxford, Santa Fe Institute), David Day (University of Florida), Peter Hernandez (Florida State University - USF), Sudeep Sarkar (USF), Paul Sandberg (USF), Georgios Anagnostopoulos (Florida Institute of Technology), Thomas O'Neal (UCF), Michael O'Donnel (UCF), Cameron Ford (UCF), Tim Kotnour (UCF) Ladislau Boloni (UCF), Rudolf Weigand (UCF), Michael Georgiopoulos (UCF), Ozlem Ozmen (UCF), Ilhan Akbas(UCF), Lori Pyle (UCF), Brian Moore (UCF), and Amanda Koontz (UCF)

JOURNAL PUBLICATIONS

(PEER REVIEWED)

SUBMITTED OR UNDER REVIEW

1. Esin Soyler and **Ivan Garibay** (2015). UCF I-Corps: The Effects of Entrepreneurial Education on Entrepreneurial Intentions. *The International Journal of Management Education.* Elsevier. (submitted)

ACCEPTED OR IN PRESS

2. Lasrado, V., Sivo, S., Ford, C., ONeal, T., and **Garibay, I.** (2015). Do graduated university incubator firms benefit from their relationship with university incubators?. *The Journal of Technology Transfer*, pp. 1-15, April, 2015.

3. Amit Goel, Sumit Kumar Jha, **Ivan Garibay**, Heinz Schmidt, and David Gilbert (2011). A Survey of Approaches to Virtual Enterprise Architecture: Modeling Languages, Reference Models, and Architecture Frameworks. *Journal of Enterprise Architechture*, 7(4), pp. 42-51.

4. **Garibay I.** (2010). Dario Floreano and Claudio Mattiussi (eds): Bio-inspired artificial intelligence: theories, methods and technologies. *Genetic Programming and Evolvable Machines Journal*, 11(3/4), pp. 441-443. (Invited Book Review)

5. **Garibay I.**, Wu, A.S., and Garibay, O. (2006). Emergence of Genomic Self-Similarity in Location Independent Representations: Favoring Positive Correlations Between the Form and Quality of Candidate Solutions. *Genetic Programming and Evolvable Machines*, 7(1), pp. 55-80.

6. Wu, A.S., and **Garibay, I.**, (2003). Intelligent Automated Control of Life Support Systems Using Proportional Representations. *IEEE Transactions on Systems, Man and Cybernetics Part B*, 34(3), pp. 1423-1434.

7. Wu, A.S., and **Garibay, I.**, (2002). The Proportional Genetic Algorithm: Gene Expression in a Genetic Algorithm. *Genetic Programming and Evolvable Machines*, 3(2), pp. 157-192.

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9. Akbas, M. I., Garibay, O. and **Garibay, I.** (2015). Professional Network Value in Business Incubator Models. *Conference of the European Social Simulation Association (ESSA)*, September, 2015.

10. Akbas, M. I.; Garibay, O. and **Garibay, I.** (2015) Regional Dynamics of Innovation and Entrepreneurship in the Optics and Photonics Industry. *International Conference on Innovation and Entrepreneurship*, Istanbul, Turkey, July, 2015.

11. Garibay, Ivan, Hollander, Christopher D., Ford, Cameron; Lasrado, Vernet, Garibay, Ozlem and O'Neal, Thomas (2013), A Simulation Study on the Firm-Level Impact of Business Incubation in an Innovation Ecosystem *Technology Transfer Society (T2S) Annual Conference: Technology Transfer and Academic Entrepreneurship*,Bergamo, Italy, November 8-9, 2013.

12. Garibay, Ivan, Hollander, Christopher D., and O'Neal, Thomas (2013), An Agent-Based Study on the Regional Impact of Business Incubation in Innovation Ecosystems. *Extended Abstract to The Conference of the European Social Simulation Association (ESSA).*, Warsaw School of Economics, Warsaw, Poland, September 16-20, 2013.

13. Garibay, Ivan, Ozlem Ozmen Garibay, Amanda Koontz, Lori Dunlop-Pyle and, Michael Georgiopoulos (2013), SONET-MATH: Using Social Networks to Learn Mathematics, *Mathematical Association of America (MAA) Conference*, Hartford, Connecticut, July 31-August 3, 2013.

14. Garibay, Ivan, Hollander, Christopher D., Khan, F., O'Neal, Thomas and Turgut, D. (2013),Towards studying the impact of business incubation on regional economic performance: a high-level overview and preliminary experiment, *The Workshop on Economic Science with Heterogeneous Interacting Agents (WEHIA)*, Reykjavik, Iceland, June 20-22, 2013.

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19. Oner M., **Garibay, I.**, and Wu, A.S (2006). Mating Networks in Steady State Genetic Algorithms are Scale Free. In the *Proceedings of Genetic and Evolutionary Computation Conference (GECCO)*, Poster, pp. 1423-1424, Seattle, USA, July 8-12, 2006.

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22. **Garibay, I.**, Wu, A.S, and Garibay, O. (2005). On location independent representations and self-organization. In the *Proceedings of the GECCO 2005 Workshop on Self-organization in Representations for Evolutionary Algorithms*, pp. 292. Washington, DC, USA, June 25-29, 2005.

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33. Hollander, Christopher D. and **Garibay, Ivan** and O'Neal, Thomas (2013), Transformation Networks: A study of how technological complexity impacts economic performance, Chapter 2 in *Managing Market Complexity: The Approach of Artificial Economics*, Series: Lecture Notes in Economics and Mathematical Systems, Vol. 662; Teglio, A.; Alfarano, S.; Camacho-Cuena, E.; Gins-Vilar, M. (Eds.), 2013, Springer. (Book Chapter)

34. **Ivan I. Garibay**, Thomas Jansen, R. Paul Wiegand, Annie S. Wu (Editors): Foundations of Genetic Algorithms, 10th ACM SIGEVO International Workshop, FOGA 2009, Orlando, Forida, USA, January 9-11, 2009, Proceedings. ACM 2009, ISBN 978-1-60558-414-0 (Book)

35. **Garibay, I.**(Editor) (2012). Student Papers, Complex Adaptive Systems Class, Fall 2012. Technical Report Number CS-TR-12-05, Complex Adaptive System Laboratory, University of Central Florida.

36. **Garibay, I.**(Editor) (2007). Student Papers, Evolutionary Computation Class, Spring 2007. Technical Report Number CS-TR-07-11, SEECS, University of Central Florida.

37. **Garibay, I.**(Editor) (2012). Student Papers, Complex Adaptive Systems Class, Fall 2011. Technical Report Number 101, Complex Adaptive System Laboratory, University of Central Florida.

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38. **Garibay, I.**, Ozmen, O., Koontz, A., Dunlop-Pyle, L., and Georgiopoulous, M. "SONET-MATH: Social Networks for Mathematics, Pilot Program Report", Summer 2012. Technical Report 11-12, Complex Adaptive Systems Laboratory, University of Central Florida.

39. **Garibay, I.** (2003). Advanced Life Support System Simulation. Technical Report CS-TR-03-05, University of Central Florida, School of Computer Science.

40. **Garibay, I.** (2000). Generating Natural Language Documentation from Statecharts. Technical Report, University of Central Florida, School of Computer Science.

PRESENTATIONS

INVITED PRESENTATIONS NATIONAL AND INTERNATIONAL

1. **Garibay I.** , Ford C., ONeal T., Ozmen O. (2014). Invited Talk: Agent-based models of business incubation in the context of innovation ecosystems. Workshop on Innovative Methods for Testing Theory in the Practice of Organizational Sponsorship *Annual Meeting of the Academy of Management.* Philadelphia, USA, August 1-5, 2014.

2. **Garibay I.** (2013). Invited Talk: Construyendo Ecosistemas de Innovacin: Incubando Empresas en la Florida y en Silicio. *3rd International Symposium on Innovation and Technology.* Cusco, Peru, November 26-28, 2013.

3. **Garibay I.** (2013). Invited Talk: Possibilities for data collection, analysis and modeling using machine learning and complexity sciences techniques. *Workshop on Data Collection, Analysis and Modeling of Nano-particle/Cell Interactions for Cancer Research.* Orlando, FL, October 11, 2013.

4. **Garibay, I.** (2011). Invited Talk: Agent-Based Modeling of Social and Economical System. *2nd International Symposium on Innovation and Technology.* Lima Peru, November 28-30, 2011.

5. **Garibay, I.**(2006). Dagstuhl Seminar 06061: Theory of Evolutionary Algorithms (participation by invitation only, financed by the German federal government). The International Conference and Research Center for Computer Science, Wadern, Germany, February 5-10, 2006.

6. **Garibay, I.** (2006). Invited Talk: Proteomics approach to Evolutionary Computation. Seminar at the Electrical Engineering and Computer Science Department, Universidad Ricardo Palma, Lima, Peru, January 4, 2006. Delivered also at a Seminar at the Research Institute of the Systems Engineering and Informatics Department, Universidad Nacional Mayor de San Marcos, Lima, Peru, January 5, 2006.

7. **Garibay, I.**, Miller J., Kumar S., Hornby G., Garibay O., and Oner K. (2006), Opening Talk: Workshop on Complexity through Development and Self-Organizing Representations: Building Complexity from Simplicity, In *Workshop Proceedings of Genetic and Evolutionary Computation Conference - GECCO 2006*, Seattle, USA, July 8-12, 2006.

8. **Garibay I.**, and Wu A.S. (2004). Opening Talk: Workshop on Self-Organization in Representations for Evolutionary Algorithms: Building complexity from simplicity. In the *Proceedings of the GECCO 2004 Workshop on Self-organization in Representations for Evolutionary Algorithms*, Seattle, USA, June 26-30, 2004.

9. Garibay 0., **Garibay I.**, and Wu A.S. (2004). Invited to submit: No Free Lunch for Module Encapsulation. In the *Proceedings of the GECCO 2004 Workshop on Modularity, Regularity and Hierarchy in Open-ended Evolutionary Computation*, Seattle, USA, Jun 26-30, 2004.

EXTENDED ABSTRACT PUBLICATIONS
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1. Akbas, Mustafa Ilhan, Garibay, Ivan (2014), An Initial Agent Based Model for Innovation Ecosystems *Swarmfest Workshop, University of Notre Dame, IN, USA, June 29-July 1, 2014*

2. Garibay, Ivan, Hollander, Christopher D., Ozmen, Ozlem and O'Neal, Thomas (2013), Towards Modeling Economic Ecosystems: an Initial Model and Preliminary Validation *Computational Social Science Society of the Americas Conference*, Santa Fe, New Mexico, August 22-25, 2013

3. Garibay, Ivan and Hollander, Christopher D (2013), The Impact of Economic Assistance on the Technology Dynamics of Innovation Systems, *Annual meeting of the Swarmfest Development Group (Swarmfest)*, Orlando, Florida, July 8-9, 2013.

4. Garibay, Ivan and Khan, Fahad (2013), An Agent Based Computational Economics Model for Creative Destruction, *Annual meeting of the Swarmfest Development Group (Swarmfest)*, Orlando, Florida, July 8-9, 2013.

5. Garibay, Ivan; Hollander, Christopher D.; Ozmen, Ozlem and Goel, Amit (2012), Yet another Appoach to Modeling Economic Phenomenon, In the *Proceedings of Swarmfest 2012*, Charlotte, NC, July 29-31, 2012

PRESENTATIONS AT NATIONAL AND INTERNATIONAL CONFERENCES AND SYMPOSIA

1. Akbas, M. I.; Garibay, O. and **Garibay, I.** (2015) Regional Dynamics of Innovation and Entrepreneurship in the Optics and Photonics Industry. *International Conference on Innovation and Entrepreneurship*, Istanbul, Turkey, July, 2015.

2. Akbas, M. I., Basavaraj, P., Garibay O., **Garibay I.** and Georgiopoulos M. (2015). Curriculum GPS: An Adaptive Curriculum Generation and Planning System. *Interservice/Industry Training, Simulation, and Education Conference (I/ITSEC)*, 2015.

3. Akbas, M. I., Garibay O. and **Garibay I.** (2015). Professional Network Value in Business Incubator Models. *Conference of the European Social Simulation Association (ESSA)*, September, 2015.

4. Akbas, Mustafa Ilhan, Garibay, Ivan (2014), An Initial Agent Based Model for Innovation Ecosystems *Swarmfest Workshop, University of Notre Dame, IN, USA, June 29-July 1, 2014*

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14. Garibay, Ivan, Hollander, Christopher D., Khan, F., O'Neal, Thomas and Turgut, D. (2013),Towards studying the impact of business incubation on regional economic performance: a high-level overview and preliminary experiment, *The Workshop on Economic Science with Heterogeneous Interacting Agents (WEHIA)*, Reykjavik, Iceland, June 20-22, 2013.

15. Garibay, Ivan; Hollander, Christopher D.; Lasrado, Vernet; Ford, Cameron; Sivo, Stephen and O'Neal, Thomas (2012), A Comparative Simulation Study on the Benefits of Entrepreneurial Support Organization Membership, In the *Proceedings of the Technology Transfer Society (T2S) Annual Conference: Technology Transfer and Academic Entrepreneurship*, New York, NY, April 19-20, 2013

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