Josep Valls-Vargas

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Education

Ph.D. in Computer Science. Drexel University, Philadelphia, PA. Sept. 2012 – Sept. 2017 (expected).

M.S. in Computer Science. Drexel University, Philadelphia, PA. Sept. 2012 – Jun. 2015 (GPA 3.87).

M.S. in Computer Vision and Artificial Intelligence. UAB. Bellaterra, Spain. Sept. 2010 – Sept. 2011.

B.S. in Computer Science/Inf. Systems Management. UAB. Sabadell, Spain. Sept. 2006 – Jun. 2010.

Work Experience

Machine Learning/Applied Scientist Intern. Amazon. Cambridge, MA. Jun 2016 – Sept. 2016.
- Alexa Science Team: Improved ML pipeline using automated detection of conflicts in annotations.

Co-Founder, Lead developer. ReferUp S.L. Barcelona, Spain. Jun. 2009 – Jan. 2013.
- Technical manager, lead developer, coordinated a team of 4 and external contractors.
- Software architecture and artificial intelligence consulting Jan. 2013 – Dec. 2014.

Software developer. CreateSpace (Amazon). Scotts Valley, CA. Nov. 2008 – Jun. 2009.
- Software development. Technical support to internal customers and Amazon.com partners.

Software developer. Doom Software. Terrassa, Barcelona, Spain. Mar. 2001 – Dec. 2006.
- CRM, POS and inventory management software. Analysis, design, implementation and support.

Selected Peer-Reviewed Publications

J. Valls-Vargas, J. Zhu, S. Ontañón (2017). **Towards Automatically Extracting Story Graphs from Natural Language Stories**. AAAI WNAIG 2017

J. Valls-Vargas, J. Zhu, S. Ontañón (2016). **Predicting Proppian Narrative Functions from Stories in Natural Language**. AIIDE 2016.

J. Valls-Vargas, J. Zhu, S. Ontañón (2016). **Error Analysis in an Automated Narrative Information Extraction Pipeline**. IEEE Transactions on CI and AI in Games.

J. Valls-Vargas, S. Ontañón, J. Zhu (2015). **Exploring Player Trace Segmentation for Dynamic Play Style Prediction**. AIIDE 2015.

J. Valls-Vargas, J. Zhu, S. Ontañón (2015). **Narrative Hermeneutic Circle: Improving Character Role Identification from Natural Language Text via Feedback Loops**. IJCAI 2015.

J. Valls-Vargas, J. Zhu, S. Ontañón (2014). **Toward Automatic Role Identification in Unannotated Folk Tales**. AIIDE 2014.

J. Valls-Vargas, S. Ontañón, J. Zhu (2014). **Toward Automatic Character Identification in Unannotated Narrative Text**. INT 7 at ELO 2014.

J. Valls-Vargas, S. Ontañón, J. Zhu (2013). **Toward Automatic Extraction of Narrative Structure from Natural Language Text**. INT6 at AIIDE 2013.

J. Valls-Vargas, S. Ontañón, J. Zhu (2013). **Towards Story-Based Content Generation: From Plot-Points to Maps**. CIG 2013.

Josep Valls-Vargas and Santiago Ontañón (2012). **Natural Language Generation through Case-based Text Modification**. ICCBR 2012.

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Projects

Voz research project. Drexel University. Mar. 2013 (ongoing).
- NLP pipeline for narrative information extraction. Python, NLTK; Java, Weka, Stanford CoreNLP and Apache OpenNLP. Semantic knowledge from WordNet, ConceptNet and PropBank.
- Web services and user interface. Webapp2, Google App Engine, HTML/CSS.

"Parallel" research project. Drexel University. Sept 2015 (ongoing).
- Learning game for parallel programming with procedural content generation. Java, Unity 3D.

TAEMILE research project. Drexel University. Mar. 2013 – Aug. 2015.
- Adaptive interactive learning environment for earth sciences. Unity 3D, C#.
- UI, real-time telemetry storage and visualization. Python, Google App Engine, jQuery, HTML/CSS.

Story2Map research project. Drexel University. Summer 2013.
- Map generator for stories from a story space defined as plot points. Python, PDDL.

Case Based Text Adaptation (CeBeTA). Universitat Autònoma de Barcelona. Summer 2012.
- Text realization module to improve the output of the Riu interactive narrative system. Python, Lisp.

Teaching and Mentoring

Mentor for PhillyCodefest (Drexel University, February 2017)

Mentor for REThink program at Drexel University (Summer 2015)

Teaching Assistant for CS 338 - Graphical User Interfaces (Winter 2015)

Teaching Assistant for CS 140 - Multimedia Programming (Fall 2014)

Teaching Assistant for Drexel University Computing Academy (Summer 2013)

Teaching Assistant for CS 171 - Computer Programming I (Winter 2013)

Teaching Assistant for CS 164 - Introduction to Computer Science (Fall 2012)

Service and Involvement

Reviewer/subreviewer: ICCC 2017, WNAIG 2017, IJCAI 2016, AAMAS 2016, AIIDE 2015, INT8 2015, FDG 2015, ICIDS 2013

Treasurer, activity coordinator. Drexel Chapter of Upsilon Pi Epsilon. 2014 – 2016.

Awards

Special Recognition award by Upsilon Pi Epsilon, International Honor Society for the Computing and Information Disciplines. Sept. 2015.

Undergraduate valedictorian and extraordinary academic achievement award by the School of Engineering at the Universitat Autònoma de Barcelona. Sabadell, Spain. Feb. 2011.

Honors in engineering graduation project "Platform for talent search using open source solutions and Web 2.0". Sabadell, Spain. May 2010.

1st award for the computer science and engineering project poster symposium. School of Engineering of Universitat Autònoma de Barcelona. Sabadell, Spain. May 2010.

Dean's and Chancellor's Undergraduate Awards for the "GPX Cleaner" software engineering project. Education abroad at University of California at Santa Cruz, CA. Jun. 2008.

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Research Overview

I am interested in studying how to enable computers to represent and understand stories, visualize narratives and use natural language as input for story generation systems. My research focuses on the exploitation of state-of-the-art natural language processing (NLP) techniques for the extraction of structured computational narrative models from free-form text.

Computational narrative is an emergent field of research at the intersection of traditional narratology, artificial intelligence, natural language processing and cognitive science. Computational narrative explores the age-old creative form of storytelling by algorithmically analyzing, understanding, and generating stories. Work in the area of story understanding has ranged from the early work of Roger Schank (Schank and Wilensky 1977; Cox and Ram 1992), focused on the higher level constructs humans use to understand, memorize and reason about stories, to more recent work from the information retrieval community (Chambers and Jurafsky 2009), focused on extracting narrative schemas (Schank's scripts) and their participants from text. Concerning story generation, work on computational creativity have yield systems capable of plot generation and interactive storytelling (Fairclough and Cunningham 2003; Mateas and Stern 2003; Peinado and Gervas 2006). These systems require the authors to provide a structured representation of the story world and rely on manual text annotations (Mani 2012). In order to alleviate the authorial burden, Finlayson (2008) created the STORY WORKBENCH, a semi-automatic tool to extract narrative structures from text. Similar work was presented by Elson (2012) in SCHEHERAZADE.

I am interested in approaches that can automatically extract narrative structures from natural language stories. Towards this goal Goyal et al. (2010) worked on extracting characters and their affect states in order to automatically create plot units. Elson et al. (2012) also worked on extracting characters and social networks from classic literature. More recent work has focused on identifying affect states and relationships between actors in movie scripts (Srivastava, Chaturvedi, and Mitchell 2015), and, the automated analysis of literature in terms of emotional arcs in the story (Reagan et al. 2016).

In my own work, I have looked into applying state-of-the-art NLP techniques to extract key narrative elements and reuse them in the context of story generation systems. I have developed a narrative information extraction pipeline the uses narrative domain knowledge to improve the performance of off-the-shelf NLP tools and is capable of identifying high-level narrative information from text such as character roles or narrative functions that define the plot of a story. I expect to be able to develop new frameworks for NLP and story generation that can be used by interactive narrative authors and computer game designers to provide a better experience for their audience. I would like to apply information extraction (IE) and machine learning (ML) techniques to extract computational narrative structures from natural language text and algorithms that can analyze text, model narratives and generate stories. I would like to explore algorithms for the extractions of higher-level structures and narrative models. My goal differs from the line of research of question answering community in that I am interested in extracting rich symbolic structures rather than statistical approaches for retrieving sentences or documents.

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Service, Community and Involvement

Computer science and artificial intelligence are all relatively modern disciplines that have aroused as key factors in today's economy. My work on computational narrative focuses on a relatively new field of study that brings together researchers from widely different areas of research; from scholars from the social sciences studying traditional literature to state-of-the-art research and cutting edge engineering in the field of artificial intelligence. Working in such an emergent field has given me the opportunity to interact with many people and has the potential to have a greater impact in society. Computational narrative may be critical in order to understand social phenomena at a large scale by enabling the analysis of vast quantities of unstructured text, either past or currently being generated online. Computational narrative and storytelling are already key element in some of the latest trends around conversational interfaces and digital assistants such as Apple's Siri or Amazon's Alexa.

I have always been a proactive person and since I joined Drexel University I have felt the support and encouragement necessary to work towards my goals. I was fortunate enough to be co-advised by faculty across the College of Computing and Informatics (Dr. Santiago Ontañón) and the Westphal College of Media Arts & Design (Dr. Jichen Zhu). Drexel University was very accommodating of this arrangement and this multidisciplinary exposition has been an unevaluable experience for my personal and academic development. At the same time, I have tried to give back to the Drexel community. In July 2013 I was part of the task force for the creation of the College of Computing and Informatics and in March 2016 I was the graduate student representative in the dean search committee for the College of Computing and Informatics. I've participated in several programs such as the summer Drexel University Computing Academy (DUCA 2013), the Research Experiences for Teachers in Engineering and Computer Science (REThink 2015) and recently I was a mentor for the PhillyCodefest 2017 organized by the College of Computing and Informatics. Additionally, I've taken part in student organizations such as the Upsilon Pi Epsilon International Honor Society for the Computing and Information Disciplines where I served as a treasurer and activity coordinator from 2014 to 2016 and I helped start up a student interest group on natural language processing in which we collaborated with the computational linguistics group at the University of Pennsylvania (we presented twice).

I firmly believe in hard work as the best and only way to achieve one's dreams. Drexel University and the College of Computing and Informatics (and the former computer science department in the college of engineering) has always provided the means for me to go the extra mile and work towards my goals.