Enhancing Authentic Web Pages for Language Learners Detmar Meurers, Ramon Ziai Luiz Amaral, Adriane Boyd, Aleksandar Dimitrov, Vanessa Metcalf, Niels Ott Universität Tübingen University of Massachusetts Amherst The Ohio State University	Enhancing Who Pages for Language Learners Marens, Zie, Amest, Royel et al. Motivation WEERT Weer Institute the enhanced Examps, Robles Propositions Residing WEETT WEETT and Voluntary Content and residential Content and residen	Our starting point Insights from Second Language Acquisition Research For successful second language acquisition, meaningful, task-based use of the language to be learned is essential. At the same time, learners benefit from or may require a so-called focus on form to overcome incomplete or incorrect knowledge (Long 1991; Lightbown 1998). Focus on Form: "an occasional shift of attention to linguistic code features" (Long & Robinson 1998, p. 23). Strategies highlighting the salience of language forms and categories are referred to as input enhancement (Sharwood Smith 1993).	Enhancing Language Learners Manuer, Zin, Anners, Din, Anners, Din, Anners, Din, Anners, Din, Anners, Din, Morrison WERTI With an and see whences Werting Wertin
Los Angeles June 5, 2010	Reading Support Tools Summary Outlook EREMAND MANDS UNITED STATA TURE MOREON	⇒ Let's use NLP to provide automatic input enhancement for language learners! → WERTi	Reading Support Tools Summary Outlook EREMAND SAME UNITED STATE TURNORN
WERTi: Working with English Real Text • Provide learners of English (ESL) with input enhancement for any web pages they are interested in. → good for learner motivation: • learners can choose material based on their interests • includes news, up-to-date information, hip stuff • pages remain fully contextualized (video, audio, links) → wide range of potential learning contexts: • can support voluntary, self-motivated pursuit of knowledge, i.e., lifelong learning. • can foster implicit learning, e.g., for adult immigrants: • already functionally living in second language environment, but stagnating in acquisition • without access/motivation to engage in explicit learning, but browsing the web for information and entertainment	Total Control	What language properties should we enhance? A wide range of linguistic features can be relevant for awareness, incl. morphological, syntactic, semantic, and pragmatic information (Schmidt 1995). We focus on enhancing language patterns which are well-established difficulties for ESL learners: determiner and preposition usage use of gerunds vs. to-infinitives wh'-question formation phrasal verbs NLP identifying other patterns can easily be integrated as part of a flexible NLP architecture.	Control and March Control Cont

Enhancing How should the targeted forms be enhanced? Enhancing Prepositions: Presentation (Color) Web Pages for Web Pages for Language Learners Language Learners Meurers, Ziai, Amaral, Soyd, et al. Meurers, Ziai. WERTi currently offers three types of input enhancement: E-mail this to a friend A Printable version Motivation Motivation Cows also 'have regional accents' WERTI WERTI a) color highlighting of the pattern or selected parts thereof Cows have regional accents 'Accent' confirms unique species like humans, language Americas b) pages supporting clicking, with automatic color feedback 15 Aug 06 | Highlands and Islands specialists have suggested. Asia-Pacific automatic feedback compares automatic annotation of 10 Jul 06 | Staffordshire Prepositions Europe Prepositions They decided to examine the What makes you local? Phrasal verbs Middle East issue after dairy farmers clicked on form with targeted form South Asia 18 Feb 05 | Magazine noticed their cows had slightly RELATED INTERNET LINKS Wh-questions different moos, depending on Wh-questions c) pages supporting practice (e.g., fill-in-the-blank), with which herd they came from. automatic color feedback WERT anchitecture WERTI architecture John Wells, Professor of Cows moo with a regional twang Pattern-specific NLP Pattern-specific NLP Phonetics at the University of automatic feedback compares form entered by learner Wates London, said regional twancs Listen Cow moo recordings TOP UK STORIES Evaluation Evaluation had been seen before in birds. with form in original text Warnings before Potters Bar crash Evaluating the NLP Magazine The farmers in Somerset who noticed the phenomenon said it. Business may have been the result of the close bond between them This follows standard pedagogical practice ("PPP"): Context and News fearls Context and and their animals. related work Science & related work MOST POPULAR STORIES NOW a) receptive presentation ICALL: ILTs and ATICAL Farmer Lloyd Green, from Glastonbury, said: "I spend a lot of ICALL: ILTs and ATICAL MOST SHARED MOST READ Data-driven learning Technology time with my ones and they definitely moo with a Somerset Data-driven learning b) presentation supporting limited interaction 1 Doubt cast on Israel raid Also in the news Reading Support Tools Reading Support Tool c) controlled practice Summary d) (free production) Outlook Outlook Source: http://news.bbc.co.uk/2/hi/5277090.stm Enhancing Prepositions: Practice (FIB) Prepositions: Presentation + Interaction (Click) Web Pages for Web Pages for Language Learners Language Learners Meurers, Ziai, Amaral, Boyd, et al Meurers, Zipi. Car-free cities: an idea with legs 22 (55) 6 11 (110) E-mail this 2 a friend A Printable version Car-free neighbourhoods are no unrealistic utopia - they exist all Motivation Motivation Cows also 'have regional accents' over Fumne Comments (68) WERTI WERTI Cows have regional accents 'Accent' confirms unique species like humans, language Asia-Pacific specialists have suggested. Example activities Brain bug changes woman's accent Steve Melia Thursday 29 Europe They decided to examine the Middle East What makes you local? South Asia issue after dairy farmers noticed their cows had slightly Gerunds vs. to-infinitives UK RELATED INTERNET LINKS different moos, depending on Wh-questions England University ? London which herd they came Realizing WERTI Realizing WERT phonetics department WERT anchitecture WERTI architecture Scotland Cows moo The BBC is not responsible A larger | smaller Pattern-specific NLP Pattern-specific NLI Wates John Wells, Professor of UK Politics Phonetics at the University Evaluation Evaluation Life and style Listen Cow moo recordings 2 London, said Evaluating learning ou TOP UK STORIES regional twangs had been seen before in birds. Evaluating the NLP * Warnings Potters Bar Health 2 Somerset who noticed the Context and Ethical and oreen living Context and Gaza ship Britons 'to head home' Science & phenomenon said it may have been the result of the close related work * Welcott left out [bond between them and their animals. ICALL: ILTs and ATICALI ICALL: ILTs and ATICAL Technology England squad 'Not anti-car, just pro-choice' ... a cyclist in Vauban, Germany, Photograph: Sign Data-driven learning Bike blog Data-driven learning Farmer Lloyd Green, from Glastonbury, said: "I spend a lot of time ? my ones and they definitely moo with a News feeds Exercise Generation Exercise Generation time so in the news Reading Support Tools HOST POPULAR STORIES NOW Reading Support Tools Somerset drawl A quarter of households in Britain - more in the larger cities, and a blog on majority in some inner cities - live without a car. Imagine how quality of Summary Summary life would improve for cyclists and everyone else if traffic were removed Outlook Outlook from areas where people could practically choose to live without cars Cycling Does this sound unrealistic, utopian? Did you know many European cities are already doing it? Source: http://www.guardian.co.uk/environment/green-living-blog/2009/oct/29/car-free-cities-neighbourhoods

Prepositions: Presentation + Interaction (Click)

Car-free cities: an idea with legs

Car-free neighbourhoods are no unrealistic utopia - they exist all over Furnne

"Not anti-car, just pro-choice" ... a cyclist in Vauban, Germany. Photograph: Sipa

A quarter of households in Britain - more in the larger cities, and a

majority in some inner cities - live without a car, Imagine how quality of

Does this sound unrealistic, utopian? Did you know many European cities

life would improve for cyclists and everyone else if traffic were removed

from areas where people could practically choose to live without cars.



Posted by Steve Melia Thursday 29 October 2009 08:00 GMT

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😑 🖾 🗗 🚾 🚇 Life and style

Series

More from Green living blog on Life and style

Environment

Series More biogposts

Source: http://www.guardian.co.uk/environment/green-living-blog/2009/oct/29/car-free-cities-neighbourhoods Phrasal verbs: Presentation + Interaction (Click)

Enhancing Phrasal verbs: Presentation (Color) Web Pages for Language Learners

Laugh Lines Funny Stuff From All Over



Letterman: 'They Don't Like Immigrants'



Monologue | Wednesday night on "The Late Show With David Letterman" on CBS: You folks been following the big British Petroleum oil spill in the Gulf of Mexico? I'm telling you, British Petroleum has put more birds in oil than Colonel

May 6, 2010, 11-14 AM

I was thinking about this, Here's what I came up with, Now, in Arizona, you know about the new immigration law, where if you don't look like you belong there, they can run you out of the state? And they've got patrol cars driving around, pulling up to people, saving: "You don't look like you belong here, Get out!" So the deal is, in Arizona, they don't like immigrants, And I was thinking, well, that's odd, because right across the river there in California, they elected one governor. Sign in to Recommend

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Motivation

WERTI

Phrasal verbs: Practice (Fill-in-the-blank)

Laugh Lines

Funny Stuff From All Over

they elected one governor.

May 6, 2010, 11:14 AM Letterman: 'They Don't Like Immigrants'



Press/Rex Festures

are already doing it?

Monologue | Wednesday night on "The Late Show With David Letterman" on CBS: You folks been following the big British Petroleum oil spill in the Gulf of Mexico? I'm telling you, British Petroleum has put more birds in oil than Colonel

Sanders.

I was thinking about this, Here's what I came up with, Now, in Arizona, you know about the new immigration law, where if you don't look like you belong there, they can run you out of the state? And they've got patrol cars driving around, pulling up to people, saving: "You don't look like you belong here. Get out!" So the deal is, in Arizona, they don't like immigrants. And I was thinking, well, that's odd, because right across the river there in California,

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Gerunds vs. to-infinitive

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May 6, 2010, 11:14 AM Letterman: 'They Don't Like Immigrants'

Monologue | Wednesday night on "The Late Show With David Letterman" on CBS: You folks been following the big British Petroleum oil spill in the Gulf of Mexico? I'm telling you, British Petroleum has put more birds

Colonel Sanders.

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California, they elected one governor.

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Meurers, Zipi. Motivation WERTI

Example activities Prepositions

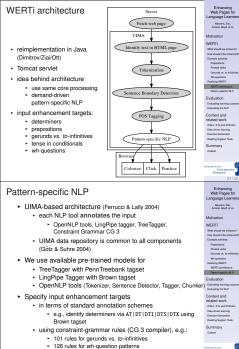
Realizing WERT WERTI architecture Pattern-specific NLP

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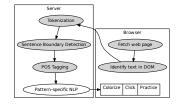
Enhancing Gerunds vs. infinitives: Practice (FIB) Enhancing Gerunds vs. infinitives: Presentation (Color) Web Pages for Web Pages for Language Learners Language Learners Mourers, Zisi, Meurers, Ziai. Motivation Motivation WERTI WERTI What should we enhance? "The government says it is expanding access to university, but they are "The government says it is expanding access to university, but they are Prepositions Prepositions actually blocking people's aspirations and betraying a generation." actually blocking people's aspirations and betraying a generation." The government was forced to cap student numbers after discovering a Realizing WERT The government was forced to cap student numbers after WERTI architecture (discover) a £200m black hole in the university financing budget at the £200m black hole in the university financing budget at the end of last year. Pattern-specific NLP Pattern-specific NLP end of last year. Labour was accused of [7] (abandon) its Labour was accused of abandoning its pledge to expand higher Evaluation Evaluation education, addingpressure to a growing debate about how to fund the pledge to expand higher education, addingpressure to a growing debate about how to fund the growing number of young people who want growing number of young people who want to do a degree. The Evaluating the NLP (do) a degree. The government is due to announce a government is due to announce a review of student finance. Context and Context and related work review of student finance. related work The massive increase in applicants has put a strain on the university ICALL: ILTs and ATICALI ICALL: ILTs and ATICALL Data-driven learning Data-driven learning The massive increase in applicants has put a strain on the university system this year, with one university forced to convert single bedrooms in Exercise Generation system this year, with one university forced to convert single bedrooms in halls into doubles, and others putting students up in hotels. Reading Support Tools Reading Support Tools halls into doubles, and others putting students up in hotels. Summary Summary Source: http://www.guardian.co.uk/education/2009/oct/14/30000-miss-university-place Source: http://www.guardian.co.uk/education/2009/oct/14/30000-miss-university-place Enhancing Wh-questions: Presentation (Color) Wh-questions: Presentation + Interaction (Click) Web Pages for Web Pages for Language Learners Language Learners Meurers, Ziai, Amaral, Boyd, et al Motivation Motivation WERTI What should we enhance? If someone takes drugs, they can become addictive depending on the drug. Overdoses If someone takes drugs, they can become addictive depending on the drug. Overdoses Example activities Example activities typically happen with cocaine, opioids, benzos, especially mixing benzos and opioids typically happen with cocaine, opioids, benzos, especially mixing benzos and opioids Physical verbs (Xanex, Valium, or Klonopin). (Xanex, Valium, or Klonopin). Why do people use illegal drugs? Why do people use illegal drugs? subject [change] WERT anchitecture WERTI architecture Pattern-specific NLP Pattern-specific NLP Most illegal drugs cause people to become intoxicated [needs proving]. The slang term for this Most illegal drugs cause people to become intoxicated [needs proving]. The slang term for this Evaluation Evaluation experience is "getting stoned" or "getting high." When a drug user is intoxicated, they may experience is "getting stoned" or "getting high." When a drug user is intoxicated, they may Evaluating the NLP feel strange, happy, dizzy, or weird. Some drugs such as marijuana and hashish often make feel strange, happy, dizzy, or weird. Some drugs such as marijuana and hashish often Context and Context and users feel sleepy and relaxed. Some drug users have feelings that they are floating or related work make users feel sleepy and relaxed. Some drug users have feelings that they are floating related work ICALL: ILTs and ATICALI dreaming. Drugs such as LSD make people feel intensely; they make one see and feel or dreaming. Drugs such as LSD make people feel intensely; they make one see and feel Data-driven learning Data-driven learning things like never before, and think things about the world they would normally not. Some Exercise Generation things like never before, and think things about the world they would normally not. Some Exercise Generation say it increases knowledge and creates wisdom. Other drugs such as Crystal Meth make Reading Support Tools Reading Support Tools say it increases knowledge and creates wisdom. Other drugs such as Crystal Meth make Summary Summary users feel excited and happy and full of energy. users feel excited and happy and full of energy. Source: http://simple.wikipedia.org/wiki/Illegal.drugs Source: http://simple.wikipedia.org/wiki/Illegal.drugs

Wh-questions: Presentation + Interaction (Click) Enhancing Wh-questions: Practice (FIB) Enhancing Web Pages for Web Pages for Language Learners Language Learners Meurers, Ziai, Amaral, Soyd, et al. Motivation Motivation WERTI WERTI If someone takes drugs, they can become addictive depending on the drug. Overdoses If someone takes drugs, they can become addictive depending on the drug. Overdoses Example activities Prepositions typically happen with cocaine, opioids, benzos, especially mixing benzos and opioids typically happen with cocaine, opioids, benzos, especially mixing benzos and opioids Phrasal verbs Phrasal verbe (Xanex. Valium, or Klonopin). (Xanex Valium or Klonopin) Gerunds vs. to-infinit Why do people use illegal drugs? subject illegal drugs? do people Why use [change] [change] WERTI architecture Why people do use illegal drugs? Pattern-specific NLP Pattern-specific NLP Most illegal drugs cause people to become intoxicated needs proving. The slang term for this Evaluation Evaluation Most illegal drugs cause people to become intoxicated [needs proving]. The slang term for this experience is "getting stoned" or "getting high," When a drug user is intoxicated, they may Evaluating the NLP experience is "getting stoned" or "getting high." When a drug user is intoxicated, they may feel strange, happy, dizzy, or weird. Some drugs such as marijuana and hashish often Context and feel strange, happy, dizzy, or weird. Some drugs such as marijuana and hashish often make Context and make users feel sleepy and relaxed. Some drug users have feelings that they are floating related work related work users feel sleepy and relaxed. Some drug users have feelings that they are floating or or dreaming. Drugs such as LSD make people feel intensely: they make one see and feel ICALL: ILTs and ATICALI ICALL: ETs and ATICALL Data-driven learning Data-driven learning dreaming. Drugs such as LSD make people feel intensely; they make one see and feel things like never before, and think things about the world they would normally not. Some Exercise Generation things like never before, and think things about the world they would normally not. Some say it increases knowledge and creates wisdom. Other drugs such as Crystal Meth make Reading Support Tools users feel excited and happy and full of energy. Summary € say it increases knowledge and creates wisdom. Other drugs such as Crystal Meth make Summary Outlook users feel excited and happy and full of energy. Source: http://simple.wikipedia.org/wiki/Illegal.drugs Source: http://simple.wikipedia.org/wiki/Illegal_drugs Enhancing Wh-questions: Practice (FIB) Realizing WERTi Web Pages for Web Pages for Language Learners Language Learners Meurers, Ziai, Amaral, Boyd, et al Meurers, Zipi. Guiding ideas behind implementation: Motivation Motivation Reuse existing NLP tools where possible WERTI WERTI · Support integration of a range of language patterns If someone takes drugs, they can become addictive depending on the drug. Overdoses Example activities Example activities First WERTi prototype (Amaral/Meurers/Metcalf at CALICO 06. typically happen with cocaine, opioids, benzos, especially mixing benzos and opioids Physical verbs EUROCALL 06) (Xanex, Valium, or Klonopin). Gerunds vs. to-infinit implemented in Python using NLTK (Bird & Loper 2004). leasizing WERT Why do people use illegal drugs? WERT anchitecture TreeTagger (Schmid 1994) Pattern-specific NLP Pattern-specific NLP Most illegal drugs cause people to become intoxicated needs proving. The slang term for this integrated into Apache2 webserver using mod_python Evaluation Evaluation experience is "getting stoned" or "getting high." When a drug user is intoxicated, they may input enhancement targets: determiners and prepositions Evaluating the NLP feel strange, happy, dizzy, or weird. Some drugs such as marijuana and hashish often make Context and in Reuters news text Context and users feel sleepy and relaxed. Some drug users have feelings that they are floating or related work dreaming. Drugs such as LSD make people feel intensely; they make one see and feel ICALL: ILTs and ATICALI still available at http://purl.org/icall/werti-v1 Data-driven learning Data-driven learning things like never before, and think things about the world they would normally not. Some Exercise Generation Exercise Generation How can we flexibly support integration of a wider range say it increases knowledge and creates wisdom. Other drugs such as Crystal Meth make Reading Support Tools Reading Support Tools of language patterns using heterogeneous set of NLP? Summary Summary users feel excited and happy and full of energy. Outlook → integrate NLP into UIMA-based architecture on server Source: http://simple.wikipedia.org/wiki/Illegal_drugs



WERTi architecture: Browser plugin version Firefox plugin (Adriane Boyd) moves fetching of web page

and text identification to client to better support sites requiring login, cookies, or dynamically generated text.



beta version at: http://purl.org/icall/werti-plugin

Evaluating input enhancement techniques Does input enhancement improve learning outcomes?

- Improving learning outcomes is the overall goal of WERTi and visual input enhancement in general.
- ► While some studies show an improvement in learning outcomes, the study of visual input enhancement sorely needs more experimental studies (Lee & Huang 2008).
- WERTi can systematically produce visual input
- enhancement for a range of language properties → Supports real-life foreign language teaching studies
 - under a wide range of parameters.
 - → Supports lab-based experiments to evaluate when
 - - Exercise Generation Reading Support Tool input enhancement succeeds in making learners notice enhanced properties (eye tracking, ERP). Outlook

Web Pages for

Language Learners

Motivation

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Meurers, Zin

Motivation

Prepositions

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Evaluation

WERTI architecture

Pattern-specific NLP

WERTI

WERTI

Evaluating input enhancement techniques High precision NLP needed for automatic input enhancement	Enhancing Web Pages for Language Learners Meuren, Zai, Amaral, Boyd, et al.	Evaluating input enhancement techniques Evaluating determiner and preposition identification	Enhancing Web Pages for Language Learners Meurers, Zial, Amaral, Boyd, et al.
 Automatic visual input enhancement requires reliable identification of the relevant classes using NLP. Note: Precision of identification of specific classes relevant, not overall quality of POS-tagging or parsing. Problem 1: Often no established gold standard available for the language classes to be enhanced. Problem 2: Realistic test set must be established by studying what pages learners choose for enhancement. 	Motivation WERTI Wat data if he without the water of the second of the s	Evaluation of preposition and determiner identification using BNC Sampler Corpus high quality CLAWS-7 annotation provides gold standard for preposition and determiner classes relatively broad representation of English Performance of the LingPipe POS tagger in WERTi:	Motivation WERTI White should be infrared. White should be infrared. White should be infrared. Exerging saldine Proportions Pr
	ERIPEGEP KONS UNIVERSITÄT TORINGRN 25/32		ERIFEGEN UNIVERSITÄT TURINGRN 26/32
Contextualizing our work	Enhancing Web Pages for Language Learners	Related Work Data-Driven Learning	Enhancing Web Pages for Language Learners Meures, Zai,
NLP has received most attention in ICALL in connection with analyzing learner language to provide feedback to the learner guide learner through material according to performance Note: Uses NLP to process learner language WERTI analyzes native language texts to identify target language categories and forms to make learners aware of them and their context of use. Note: Uses NLP to process well-formed, native language Authentic Text ICALL (ATICALL) Related work: Data-Driven Learning Automatic Exercise Generation Reading Support Tools	Activation Stoppe of all Moderates Stoppe of all Moder	 One can view automatic input enhancement as an enrichment of Data-Driven Learning (DDL). DDL is an "attempt to cut out the middleman [the teacher] as far as possible and to give the learner direct access to the data" (Boulton 2009, p. 82, citing Tim Johns) WERTI: learner stays in control, but NLP uses 'teacher knowledge' about relevant language properties to make those more prominent to the learner. 	America Royal et al. Motivation WERTI una enternació las enternació la enternació

Related Work Automatic Exercise Generation	Enhancing Web Pages for Language Learners Mourner, Zai, Amarat, Goyd, et al.	Related Work Reading Support Tools	Enhancing Web Pages for Language Learners Meaves, Zial, Amaral, Boyd, et al.
 Antoniadis et al. (2004) describes plans of MIRTO project to support "gap-filling" and "lexical spotting" exercises in combination with a corpus database. VISL project (Bick 2005) offers games and visual presentations to foster knowledge of syntactic forms/rules. KillerFiller produces slot-filler exercises from corpus texts; presented in isolation, in a testing setup. 	Molivation WEETT White Inhale we effected Weet Inhale we effected Weet Inhale we effected Examps skilleds Proposition Proposition Proposition Resident Web-parentine Resident WEETT Web-parentine Pattern specific IA.P Pattern specific IA.P Confect and resident web-parentine Resident WEETT Confect and resident web-parentine Resident Weettern Resident Weet	 Glosser-RuG (Nerbonne et al. 1998): supports reading of French texts for Dutch learners context-dependent dictionary, morphological analysis, and examples of word use in corpora COMPASS project (Breidt & Feldweg 1997): similar to Glosser-RuG, focusing on multi-word lexemes ALPHEIOS project (http://slpheios.net): supports lexicon lookup and provides aligned translations REAP project (http://reap.cs.cmu.edu) supports learners in searching for texts that are well-suited for providing vocabulary and reading practice (Heilman et al. 2008b). 	Modification WERTI With another sentence? With another sentence? Example solities Proposition Proposit
	Emenus-Xuna Universität Titutionan 29/32		ERIPEMPENIAN UNIVERSITÄT TURINGRIN 30/32
Summary	Enhancing Web Pages for Language Learners	Outlook: Questions to be addressed	Enhancing Web Pages for Language Learners
We motivated and discussed an approach providing automatic input enhancement of authentic web pages. NLP identifies relevant linguistic categories and forms. The sentences turned into activities can remain fully contextualized as part of the pages selected by learner. Automatic feedback for the practice activities is feasible since the original text is known. Next step: Where possible alternatives exist, determine equivalence classes automatically; e.g., tor prepositions building on Elghafari, Meurers & Wunsch (2010). Web pages are selected by learners based on interests. Next step (Ott & Meurers submitted): Develop search engine which takes into account content of interest to learner general readability measures (Petersen 2007; Heilman et al. 2008, Milisaakia is Toual 2006) language properties to be input enhanced	Motivation (I) Motiva	Which language pattern types should be input enhanced? adverb placement tense and aspect * while effect is semantic, lexical cues can be identified by NLP ("usually go" vs. "are going tomorrow") passive vs. active Which aspect of the patterns should be input enhanced? lexical classes, morphemes contextual clues (optional or obligatory) What is the best input enhancement, i.e., highlighting or interaction possibilities for a particular linguistic pattern, given a specific web page with its existing visual design features?	Motivation WEFTI Moderate State Stat

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Enhancing Web Pages for Language Learners Mourers, Ziai,

Motivation WERTI

Prepositions Phrasal verbs Wh-questions WERT anchitecture

Pattern-specific NLP Evaluation Evaluating the NLP Context and related work ICALL: ILTs and ATICALI Data-driven learning

Reading Support Tools Summary Lee S.-K & H.-T Huang (2008) VISUAL INPUT ENHANCEMENT AND GRAMMAR LEARNING: A Meta-Analytic Review. Studies in Second Language Acquisition 30, 307-331,

Enhancing Web Pages for Language Learners

WERTI

Meurers, Ziai, Amaral, Boyd, et al

Prepositions Physical verbs Gerunds vs. to-infinitives Wh-questions Realizing WERTI WERT anchitecture Pattern-specific NLP

Evaluation Evaluating the NLP Context and

Data-driven learning Exercise Generation Reading Support Tools Summary

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> WERTI WEDT architecture

> > Pattern-specific NLP

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Evaluation

Context and

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Motivation

Enhancing

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Motivation

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