A4LL : Analytics for Language Learning

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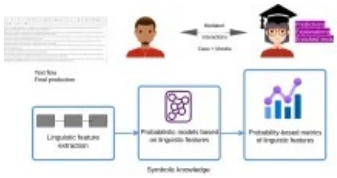
Why does my English teacher only ever underline the mistakes in my essays? Why does it take so long to correct my essay?



Description

The A4LL project will develop an innovative language-learning analytics system designed to assist teachers and learners with objective reports linking proficiency with linguistic features. Thomas Gaillat, the coordinator, proposes an approach relying on textual measures operationalising global and structure complexity, phraseology, discourse cohesion, and fluency. These measures will support the automatic creation of graphic reports used by teachers to diagnose their learners' productions. A4LL's ambition is to create the first fully automated L2 (Second language) analysis system serving learners, teachers, and researchers at university via an integrated data workflow from ingestion to analytics.

Research questions

The A4LL project will deliver an L2 analytics system for learners and teachers of English at university level. The project will address 3 main research questions aiming to uncover some of the features of Interlanguage, i.e the unstable linguistic system demonstrated by learners of a second language: i) what are the language features that are related to specific proficiency levels? ii) how can these features be measured automatically? iii) how can measures be converted into meaningful analytics for descriptive feedback and teaching decisions?

Interlanguage can be seen as a complex multifactorial system which makes the identification of criterial proficiency features difficult. Over time and practice, the system gradually stabilises. However, it is not clear which factors are at play at a given point. To cast a light on how interlanguage develops, current research shows that approaches combining linguistic measurements and statistics within computer models help to highlight some features of interlanguage (Ballier et al., 2020; Yannakoudakis et al., 2018). However, current state-of-the-art metrics lack linguistic meaningfulness and so impair interpretability.

Objective

The objective is to develop a computer system that automatically generates linguistic diagnostics of learner writings. These diagnostics will therefore be visualised by teachers through MOODLE, one of the main open-source LMS in France and in the world. These diagnostics will help teachers formulate advice for their students and adapt their teaching objectives in relation to their groups' profiles. Developing the system will imply research work to identify correlations between linguistic features and metadata including task types, proficiency, learning habits and writing ability.
The system will collect, automatically analyse and provide specific linguistic feedback for writings submitted in MOODLE (see Figure 1). By exploiting lexical, syntactic and semantic metrics, the system will point out the dimensions that require attention in each writing. Graphical visualisations will show which linguistic areas to improve for a targeted proficiency level. The system will rely on a supervised learning approach with learner data collected in the two Language Centres (in charge of 20,000 students learning English for Specific Purposes) of the two universities of Rennes. It will be modular to allow subsequent integration of other languages.

A4LL intends to leverage the strength of two previously developed prototypes in which the coordinator participated. The first prototype, developed in 2019 (Gaillat, Simpkin, et al., 2021), provides automatic classification of learner writings according to the levels of the CEFR. The second prototype, called VizLing (Gaillat, Knefati, et al., 2021), and developed in 2019, focused on the automatic generation of graphs to visualize linguistic complexity in writings. A4LL will expand in the same avenue, but it will rely on a selection of significant and linguistically descriptive metrics for second language analysis. A4LL will unify the Natural Language Processing tasks under a single framework producing visualisations in MOODLE. It will rely on learner metadata in order to allow teachers to profile their learners and personalise feedback.
The purpose of A4LL is thus i) to offer the language teaching community data analytics tools that help position learners according to proficiency and aspects of their language. ii) to model learner language to map linguistic features with proficiency and, ultimately, interlanguage stages. A4LL intends to provide a solution for university language centres, in France and abroad, that are in charge of millions of students studying languages for professional purposes.

Partners

Institution	Last Name	First Name	Role
Rennes 2 University	*GAILLAT*	*Thomas*	*PI & Associate Professor*
Rennes 2 university	MALLART	Cyriel	Research Engineer
Rennes 2 University	*LI*	*Jen-Yu*	*Ph.D. candidate*
Rennes 2 University	*FAUGERE*	*Anatole*	*Research Assistant and Computer programmer*
University of Paris Cité	*BALLIER*	*Nicolas*	*Professor of Linguistics*
University of Paris Cité	*LISSON*	*Paula*	*Research Engineer*
University of Galway	*SIMPKIN*	*Andrew*	*Associate professors in Statistics*
University of Galway	*STEARNS*	*Bernardo*	*Research Associate*
Le Mans University	*VENANT*	*Rémi*	*Associate Professor*
IRISA / INSA Rennes	*SÉBILLOT*	*Pascale*	*Professor of Computer Science*
IRISA / CNRS	*GRAVIER*	*Guillaume*	*Senior Research Scientist*

Partner project

Deep Learning for Language Assessment (DLLA)

Expert annotators

CEFR Annotation

Institution	Expert	Role	Structure
Rennes 2 University	Joanne Ward-Henry	English teacher	Centre de Langues Rennes 2
Rennes 2 University	Francoise Le Roux	English teacher	Centre de Langues Rennes 2
University of Rennes	Benedicte Dumont	English teacher	SCELVA, Univ de Rennes
University of Rennes	Pascale Janvier	English teacher	SCELVA, Univ de Rennes

Linguistic Annotation

- Team members: Paula, Nicolas and Thomas
- Université Paris Cité - CLILLAC-ARP: Jessica Tayeh

Conferences & publications

2025

Journal articles

titre
Assessing the validity of syntactic alternations as criterial features of proficiency in L2 writings in English
auteur
Cyriel Mallart, Andrew Simpkin, Nicolas Ballier, Paula Lissón, Rémi Venant, Bernardo Stearns, Jen-Yu Li, Thomas Gaillat
article
Research Methods in Applied Linguistics, 2025, 4 (3), pp.100238. ⟨10.1016/j.rmal.2025.100238⟩
Accès au bibtex

titre
Exploring the cross-lingual influence of linguistic complexity in second language writing assessment
auteur
Sara Geremia, Thomas Gaillat, Nicolas Ballier, Andrew Simpkin
article
Assessing Writing, 2025, 66, pp.100951. ⟨10.1016/j.asw.2025.100951⟩
Accès au bibtex

Conference papers

titre
Predicting CEFR levels for learners of English with keylogging metrics, an exploratory study
auteur
Ahood Al Swar, Erin Pacquetet, Cyriel Mallart, Andrew J. Simpkin, Nicolas Ballier
article
CORIA-TALN 2025, Université d'Aix-Marseille et les UMR CNRS LIS et LPL, Jun 2025, Marseille, France.
https://talnarchives.atala.org/ateliers/2025/DYNTAL/index.html
Accès au texte intégral et bibtex

titre
Actionability in CALL: linking proficiency prediction models to interpretable indicators
auteur
Thomas Gaillat, Cyrielle Mallart, Andrew Simpkin, Rémi Venant, Nicolas Ballier, Bernardo Stearns, Jen-Yu Li, Paula Lissón

article
International Workshop on Foreign language learning and proficiency-rated reading materials: SLA research and AI methods supporting analysis and effective didactics in real-life education, Universität Tübingen, Mar 2025, Tübingen, Allemagne, Germany
Accès au bibtex

titre
L'usage des collocations en anglais d'apprenants : une analyse croisée des L1 et des niveaux de compétence
auteur
Jen-Yu Li
article
Approches interdisciplinaires des unités phraséologiques (UP) dans les langues du monde : Linguistique - TAL & IA - Traduction - Littérature, Mar 2025, Paris, France
Accès au bibtex

Other publications

titre
Annotated English Verb Noun collocation dataset
auteur
Jen-Yu Li
article
2025
Accès au bibtex

titre
CELVA.Sp processed with A4LL metrics pipeline
auteur
Thomas Gaillat, Cyriel Mallart, Andrew J. Simpkin
article
2025, ⟨10.34847/nkl.3aba968r⟩
Accès au bibtex

Reports

titre
A language-learning analytics system" project DMP
auteur
Nicolas Ballier, Thomas Gaillat, Jen-Yu Li, Cyriel Mallart, Andrew Simpkin, Bernardo Stearns, Rémi Venant
article
Opidor. 2025, https://dmp.opidor.fr/plans/13498
Accès au texte intégral et bibtex

Preprints, Working Papers, ...

titre
Assessing the validity of new paradigmatic complexity measures as criterial features for proficiency in L2 writings in English
auteur
Cyriel Mallart, Andrew Simpkin, Nicolas Ballier, Paula Lissón, Rémi Venant, Jen-Yu Li, Bernardo Stearns, Thomas Gaillat
article
2025
Accès au texte intégral et bibtex

2024

Conference papers

titre
La linguistique de corpus à l'heure du code ouvert
auteur
Cyrielle Mallart, Thomas Gaillat, Rémi Venant, Nicolas Ballier, Jen-Yu Li, Bernardo Stearns
article
Deuxième journée d'étude ARDoISE, INRIA, Dec 2024, Rennes, France
Accès au bibtex

titre
Evaluating the Generalisation of an Artificial Learner
auteur

Bernardo Stearns, Nicolas Ballier, Thomas Gaillat, Andrew J. Simpkin, John P. Mc Crae

article

NLP4CALL2024 : Natural Language Processing for Computer-assisted Language Learning, Université Rennes 2, France; University of Gothenburg, Sweden; Linköping University, Sweden, Oct 2024, Rennes, France

Accès au texte intégral et bibtex

titre

Overview of the linguistic features: creating measures – Joint presentation

auteur

Nicolas Ballier, Bernardo Stearns, Jen-Yu Li

article

pre-conference workshop to NLP4CALL 2024, Oct 2024, Rennes, France

Accès au bibtex

titre

Exploring learner knowledge with Large Language Models fine-tuned with the EFCAMDAT

auteur

Nicolas Ballier, Bernardo Stearns

article

LCR2024 Learner Corpus Research conference, University of Tartu; Learner Corpus Association, Sep 2024, Tartu (Estonie), Estonia

Accès au texte intégral et bibtex

titre

Assessing the validity of new structural complexity measures as features of proficiency in L2 English

auteur

Thomas Gaillat, Cyriel Mallart, Nicolas Ballier, Andrew Simpkin, Rémi Venant, Bernardo Stearns, Paula Lissón, Jen-Yu Li

article

Learner Corpus Research Conference, University of Tartu, Sep 2024, Tartu (Estonie), Estonia

Accès au bibtex

titre

Analytics for Language Learning. Linguistic interoperability within a unified architecture

auteur

Cyriel Mallart, Andrew Simpkin, Rémi Venant, Nicolas Ballier, Bernardo Stearns, Jen-Yu Li, Thomas Gaillat

article

Langues & Langage à la croisée des Disciplines 1ère Rencontre annuelle LLcD, Sep 2024, Paris, France

Accès au bibtex

titre

Linguistic interoperability within a unified architecture

auteur

Thomas Gaillat, Cyrielle Mallart, Andrew J. Simpkin, Rémi Venant, Nicolas Ballier, Jen-Yu Li, Bernardo Stearns

article

Langues & Langage à la croisée des Disciplines - 1ère Rencontre annuelle LLcD, Sorbonne Université; cnrs, Sep 2024, Paris, France

Accès au texte intégral et bibtex

Other publications

titre

Understanding Large Language Models

auteur

Cyriel Mallart

article

2024

Accès au bibtex

titre

Dictionary of Bigram-Score extracted from BNC with all association meausres by NLTK

auteur

Jen-Yu Li

article

2024

Accès au bibtex

Proceedings

titre
Proceedings of the 13th Workshop on Natural Language Processing for Computer Assisted Language Learning
auteur
Thomas Gaillat, Cyriel Mallart, Fabienne Moreau, Griselda Drouet, Jen-Yu Li, David Alfter, Elena Volodina, Arne Jönsson
article
The 13th Workshop on Natural Language Processing for Computer Assisted Language Learning, Oct 2024, Rennes, France. LiU Electronic Press, 2024, Linköping electronic conference proceedings
Accès au texte intégral et bibtex

Software

titre
Analytics for Language Learning
auteur
Cyriel Mallart, Rémi Venant, Andrew Simpkin, Nicolas Ballier, Jen-Yu Li, Bernardo Stearns, Thomas Gaillat
article
2024, ⟨swh:1:dir:d6ede95f5f25ec32fc400313c34d72a4fe12e9db;origin=https://gitlab.huma-num.fr/lidile/a4ll_mlpipeline.git;visit=swh:1:snp:a105a84ae8ae0f52445fc598870a45ed584c17e0;anchor=swh:1:rev:5c48738c7d9789988356711e248f300173ab95c6⟩
Accès au bibtex

2023

Scientific blog post

titre
CELVA.sp: A new learner language data set for the study of English for Specific Purposes at university level
auteur
Thomas Gaillat, Cyrielle Mallart, Rémi Venant, Nicolas Ballier, Jen-Yu Li, Bernardo Stearns, Andrew Simpkin
article
2023
Accès au bibtex

Conference papers

titre
L'interopérabilité des corpus pour la modélisation des dynamiques d'acquisition de langue seconde
auteur
Thomas Gaillat, Cyrielle Mallart, Nicolas Ballier, Andrew Simpkin, Rémi Venant, Anatole Faugère, Bernardo Stearns, Jen-Yu Li, Paula Lissón
article
Journée d'étude : « Corpus d'apprenants / corpus d'experts : Quels enseignements pour la caractérisation du discours scientifique ? », UR 3967 - CLILLAC-ARP : Centre de Linguistique Inter-langues, de Lexicologie, de Linguistique Anglaise et de Corpus - Atelier de Recherche sur la Parole; UFR EILA - Etudes Interculturelles de Langues Appliquées, Faculté Sociétés et Humanités d'Université Paris Cité, Dec 2023, Paris, France
Accès au bibtex

titre
Analytics for Language Learning: Interfacing MOODLE with A4LL via LTI
auteur
Thomas Gaillat, Cyrielle Mallart, Nicolas Ballier, Andrew Simpkin, Rémi Venant, Bernardo Stearns, Jen-Yu Li, Paula Lissón, Anatole Faugère
article
Deep learning for language assessment closing event (DLLA Closing event 2023), UR 3967 - CLILLAC-ARP : Centre de Linguistique Inter-langues, de Lexicologie, de Linguistique Anglaise et de Corpus-Atelier de Recherche sur la Parole; UFR EILA de l'Université Paris Cité, Nov 2023, Paris, France
Accès au bibtex

titre
Exploring a New Grammatico-functional Type of Measure as Part of a Language Learning Expert System
auteur
Cyriel Mallart, Andrew Simpkin, Rémi Venant, Nicolas Ballier, Bernardo Stearns, Jen-Yu Li, Thomas Gaillat
article
Proceedings of the 18th Workshop on Innovative Use of NLP for Building Educational Applications (BEA 2023), Jul 2023, Toronto, Canada. pp.466-476, ⟨10.18653/v1/2023.bea-1.39⟩
Accès au texte intégral et bibtex

titre
Analytics for Language Learning : Transmettre aux enseignants les profils linguistiques de leurs apprenants
auteur

Thomas Gaillat, Cyrielle Mallart, Anatole Faugère, Andrew Simpkin, Bernardo Stearns, Paula Lissón, Jen-Yu Li, Nicolas Ballier, Rémi Venant
article
Atelier GERAS @ 62e Congrès annuel de la SAES 2023, Université Rennes 2; SAES La Sorbonne Nouvelle; GERAS (Groupe d'Etude et de Recherche en Anglais de Spécialité), Jun 2023, Rennes, France
Accès au bibtex

titre
Grammatical profiling with UD annotation (WiP)
auteur
Nicolas Ballier, Cyrielle Mallart, Thomas Gaillat
article
Workshop on Profiling second language vocabulary and grammar, University of Gothenburg, Humanisten., Apr 2023, Gothenburg, Sweden
Accès au bibtex

Poster communications

titre
Exploring Verb-Noun collocations in learner English
auteur
Jen-Yu Li, Cyriel Mallart, Thomas Gaillat, Elisabeth Richard
article
Deep learning for language assessment (DLLA) closing event, Nov 2023, Paris, France
Accès au texte intégral et bibtex

titre
Vers une grammaire probabiliste de microsystèmes fonctionnels en L2
auteur
Cyrielle Mallart, Andrew Simpkin, Rémi Venant, Nicolas Ballier, Bernardo Stearns, Jen-Yu Li, Thomas Gaillat
article
RéAL2: Grammaire(s) et acquisition des L2: Approches, trajectoires, interfaces,, Oct 2023, Grenoble, France
Accès au texte intégral et bibtex

2022

Conference papers

titre
Language learning analytics : designing and testing new functional complexity measures in L2 writings
auteur
Thomas Gaillat
article
11th Workshop on Natural Language Processing for Computer-Assisted Language Learning (NLP4CALL 2022), Dec 2022, Louvain la Neuve, Belgium. pp.55-60, ⟨10.3384/ecp190006⟩
Accès au texte intégral et bibtex

2018

Software

titre
CELVA.Sp corpus User Interface
auteur
Thomas Gaillat, Rémi Venant, Cyriel Mallart, Taylor Arnold, Anatole Fougère
article
2018, ⟨swh:1:dir:7405005eae86eb3f53662e5649f10f5c4f92e11a;origin=https://gitlab.huma-num.fr/lidile/celva.sp-ui;visit=swh:1:snp:198c7b3333fa18b5a721d36e06e8a5a0648600e3;anchor=swh:1:rev:95c370947852a8fe6ef9254069ca7812fd901188⟩
Accès au bibtex

Deliverables

Software

- Gitlab LIDILE: The A4LL tool is available for download and installation (expertise required in Docker technology). It is made upd of two components: A4LL_MLpipeline and A4LL_Tool
- A Tool for learner corpus collection: The CELVA.SP User Interface for MOODLE
- The Google Colab for the Workshop « Enrichissement linguistique des données textuelles« , an Introduction to Python for Humanities Experts.

Supported by Rennes Métropole & ANR

Datasets & corpora

Learner corpus of language for Specific Purposes Three datasets on Nakala:

- One with Dialang CEFR annotation
- Two batches with human expert CEFR annotation: 2018-2022 and 2023-2024

Credits: Many thanks to the language teachers of the universities of Rennes for their involvement
18 December 2024