I. General guidelines on content and language use for technical reports/publications

A. Guide de rédaction pour l'ingénieur civil - consignes

Many recommendations on writing technical reports are as valid in the Francophone world as they are in the Anglosphere. We will look at some recommendations on content and language found in the French writing manual for civil engineers, the "Guide de rédaction pour l'ingénieur civil"

4.4 Adopter un style d'écriture adéquat

1. Be concise, precise and clear

    - Keep the client's perspective in mind. This means providing information about your general approach and method, hypotheses, results and discussion *in keeping* with the client's objectives. The information in your technical report - at each and every step - should have a clear link with your client's objectives.

4.4.2 Phrases et vocabulaire

1. Start with the main sentence instead of the subordinate sentence. As in:

« Bien que le groupe d'âge 50-54 ans n'ait pas été considéré, le taux de chômage dans l'arrondissement Rosemont-Petite-Patrie a diminué de 0,5% par rapport à 2013. »

La même phrase, débutant par la proposition principale :

« Le taux de chômage dans l'arrondissement Rosemont-Petite-Patrie a diminué de 0,5% par rapport à 2013, bien que les résultats ne considèrent pas le groupe d'âge 50-54 ans. »

An example of this sentence structure in English:

After increasing the pH of the substratum to 9, the gold-containing molecules bound to it.
Should be:
The gold-containing molecules bound to the substratum when we increased its pH to 9.

2. Use the active voice as much as possible. As in:

- voix active : « L'ingénieur prépare les plans. »
- voix passive : « Les plans sont préparés par l'ingénieur. »

A box was designed to contain all the electronics parts and a battery to power the raspberry . Since Pepper has about 8 hours of autonomy, it is preferable that the

3. Avoid using emotive language. As in:

- « Après plusieurs simulations et un travail acharné, la solution... »
- « Grâce aux explications détaillées des techniciens de laboratoire, la mesure a été prise... »

4. Avoid superlatives, possessive pronouns and flowery adjectives. Compare the following two sentences

« Les résultats d'essais de chargement sont vraiment concluants. »

« Les résultats d'essais de chargement sont concluants, **les écarts types entre les valeurs calculées et mesurées étant inférieurs à 5% pour tous les essais.** »

The latter sentence provides information which allows a reader to decide whether the results are in fact conclusive. The problem with using adjectives in an inappropriate fashion is that they function as a rhetorical device and muddy the waters, getting in the way of letting the results speak for themselves.

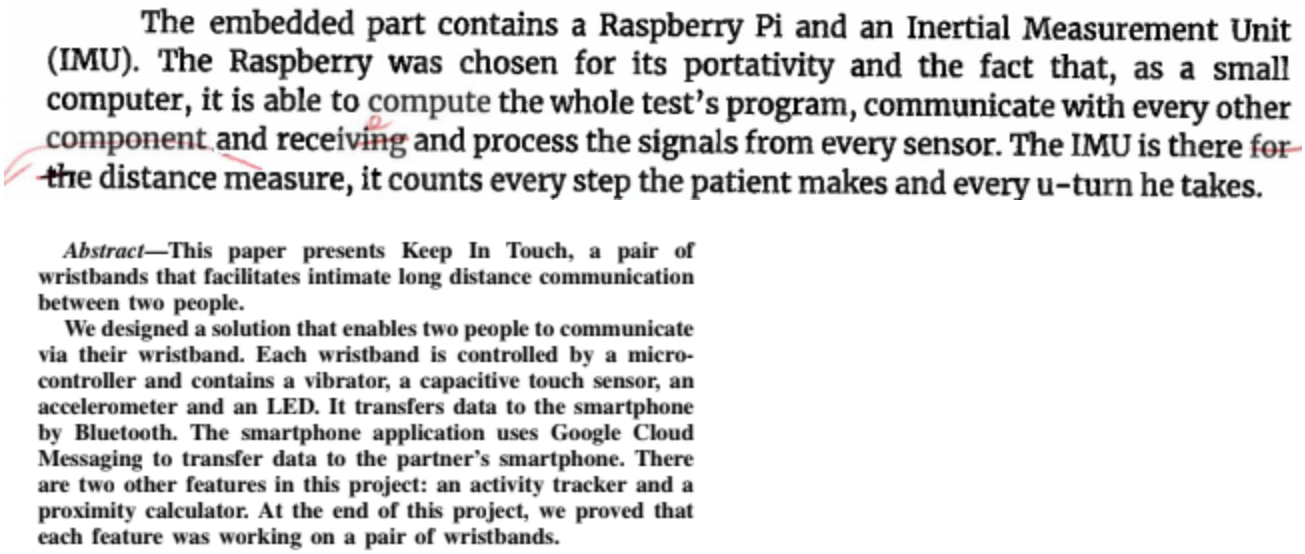
4.4.4 Temps de verbe

When it comes to using tenses, technical publications in English and French are somewhat different.

Privilégier les verbes conjugués à l'indicatif présent ou au passé composé. Le passé simple est souvent exigé pour les articles scientifiques. Cependant pour les rapports techniques en ingénierie, il est préférable d'utiliser le passé composé qui est plus simple à rédiger et à lire. Privilégier l'utilisation du même temps de verbe dans tout le document (École Polytechnique de Montréal, 2010). Choisir un temps de verbe qui n'est pas adéquat peut contribuer à modifier le sens, ou altérer la précision de la phrase.

In English, the 'simple past' is used mainly in the 'Materials and Methods' sections and the 'Results' section. The simple present is the preferred tense for the other sections . The 'Abstract', representing a summary of different sections in the report, usually has a mixed set of tenses.

Before the test begins, the nurse ~~will have~~ to equip the patient with the embedded prototype. The whole thing fits in a box, represented in figure 2, which is connected to an oximeter that the patient wears on his finger.



The embedded part contains a Raspberry Pi and an Inertial Measurement Unit (IMU). The Raspberry was chosen for its portativity and the fact that, as a small computer, it is able to compute the whole test's program, communicate with every other component and receiving and process the signals from every sensor. The IMU is there for the distance measure, it counts every step the patient makes and every u-turn he takes.

Abstract—This paper presents Keep In Touch, a pair of wristbands that facilitates intimate long distance communication between two people.

We designed a solution that enables two people to communicate via their wristband. Each wristband is controlled by a micro-controller and contains a vibrator, a capacitive touch sensor, an accelerometer and an LED. It transfers data to the smartphone by Bluetooth. The smartphone application uses Google Cloud Messaging to transfer data to the partner's smartphone. There are two other features in this project: an activity tracker and a proximity calculator. At the end of this project, we proved that each feature was working on a pair of wristbands.

There is one exception to the 'simple past' rule: The 'present perfect' is used in the first sentence of a paragraph that summarizes other researchers' findings.

Example: *"Smith et al have reported that ...(ref.), but they used mice not rats. In a more recent study, Jones found that...(ref.)".*

B. Guide de rédaction pour l'ingénieur civil - examples and improvements (pair work)

a) Example of a concluding sentence which is part of the Discussion section: *In conclusion, the objective of our laboratory was to measure the overall performance of the first three types of treatment on the variables described in the introduction.*

How could you improve this sentence (three suggestions)

b) Moreover, a significant decrease in the alkalinity and color of the sample specimens have been observed

How could you improve this sentence (three suggestions +1 grammatical error)

c) During the ideation phase of the model, the constraints that were determined in advance had to be respected.

How could you improve this sentence (two suggestions)

II. On using Google Translate

A. Introduction

With more languages and language combinations available than the competition, it's easy to see why Google Translate is often the first choice when it comes to machine translation engines.

Google Translate began life as a Statistical Translation System or in layman's terms, a word-by-word translation system. Of course, when translating in this manner, little sense is often made from the final result, and invariably the results lacked crucial context.

However, back in 2016, Google altered its machine translation engine to a neural machine translation system. Utilizing deep learning techniques, it now translates entire sentences at a time, granting a higher degree of accuracy and understanding, and also affording a small measure of context. But given its existing advances and continued evolution, as of 2018, it translates more than 100 billion words a day.
(source: https://www.textunited.com/blog/best-free-machine-translation-engines/)

B. Listening comprehension: broad comprehension questions

Video: The Technology Behind Machine Translation | Understanding with Unbabel
Speed: 85%

1. Vocabulary

Word	***Part of speech***	**Meaning**
Toddler	*noun*	A young child
Syntactic tree		A tool used to analyze sentence structure
Collocate	*verb*	Here: collocated is a term used to indicate that certain words are found together quite often → 'collocated parts of speech', e.g.: adjectives and nouns that frequently occur together like 'free' and 'radicals'
Rack up	*Phrasal verb*	To accumulate, one by one
Chance	*adjective*	Meaning, 'by accident' as in: *a chance encounter*
Encounter	*noun*	An unplanned 'meeting' with someone or something
Senseless	*adjective*	Without meaning, without good reason, instinctive, impulsive

Word	***Part of speech***	**Meaning**
Rampage	*noun*	Violent, impulsive actions or behaviour
Dextrous	*adjective*	Skillful, clever
Property	*noun*	Here: characteristic
Tangible	*adjective*	The ability to be known through our 5 senses
To have the upper hand		To have the advantage that allows you to win a competition or a struggle

2. Vocabulary exercise - fill in the blank

a) Even though the victorious army (expression), they went on a and burned many villages in the process.
b) There was a sense of relief in the room as the rumours about her illegitimate son were (expression).
c)Scientists' for a better understanding of between adult panda's could improve the species' of survival.

3. Broad comprehension questions

a. How would you describe the concept of 'word embeddings'? In other words, how can similarities between words be represented numerically?

b. The text mentions the fact that coding for 'tangible properties', as mentioned in the example (dangerous, furry), are not a good representation of how a language model operates. Why is that?

c. "That way, when a well-trained machine translation engine runs into the word friend, it'll know not to translate the verb 'run into' so literally." How would you translate 'to run into' in this context?

C. Translating technical papers in French using Google Translate

1. Correct the following paragraphs from the French technical report

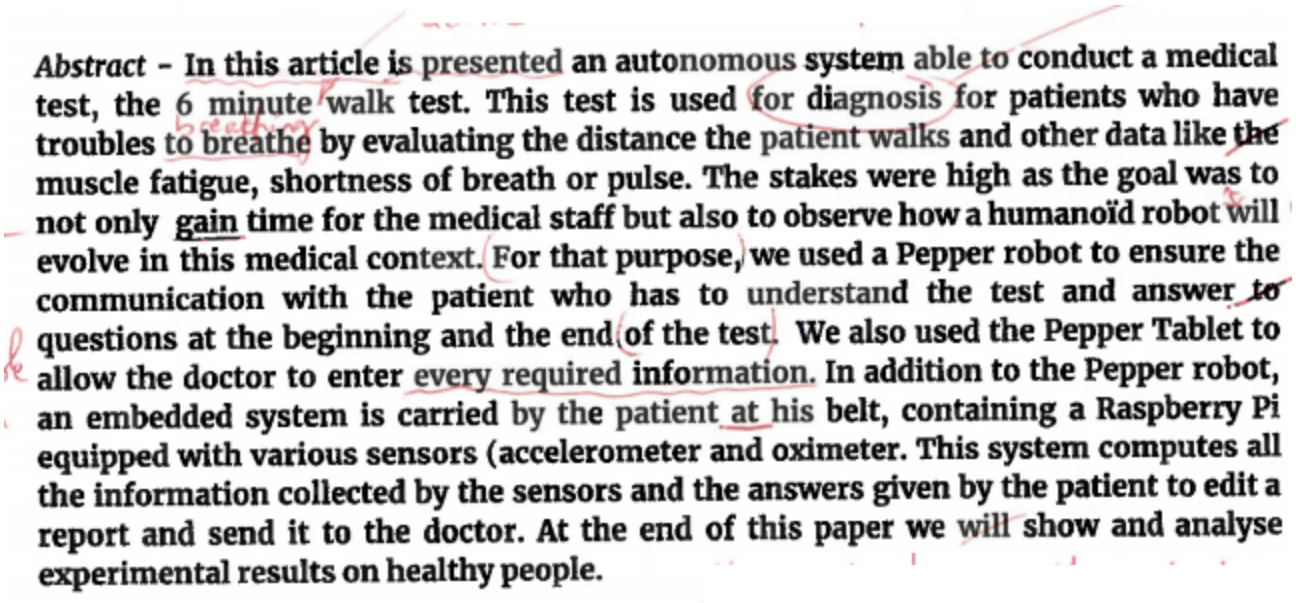
a. À noter que la spécification initiale ne précise pas ce que doit faire le système après la coupure des moteurs. Nous avons décidé lors de la conception fonctionnelle de compléter cette spécification en indiquant qu'il y a deux actions suite à l'arrêt des moteurs.

   Note that the initial specification does not specify what should do the system after the engines have been cut. We have decided during the functional design to supplement this specification by indicating that there are two actions following the *stopping* of the engines.

b. Bien sûr l'exemple n'est pas complet, en effet, le but de cet article est d'illustrer la démarche sans chercher à réaliser une documentation complète comme nous le ferions sur un projet opérationnel.

   Of course the example is not complete, indeed, the goal of this article is to illustrate the process without trying to achieve a complete documentation as we would on a project operational.

IV. Improving passages from an actual PolyTech 5 technical report



Abstract – In this article is presented an autonomous system able to conduct a medical test, the 6 minute walk test. This test is used for diagnosis for patients who have troubles to breathe by evaluating the distance the patient walks and other data like the muscle fatigue, shortness of breath or pulse. The stakes were high as the goal was to not only gain time for the medical staff but also to observe how a humanoïd robot will evolve in this medical context. For that purpose, we used a Pepper robot to ensure the communication with the patient who has to understand the test and answer to questions at the beginning and the end of the test. We also used the Pepper Tablet to allow the doctor to enter every required information. In addition to the Pepper robot, an embedded system is carried by the patient at his belt, containing a Raspberry Pi equipped with various sensors (accelerometer and oximeter. This system computes all the information collected by the sensors and the answers given by the patient to edit a report and send it to the doctor. At the end of this paper we will show and analyse experimental results on healthy people.

1. **Problems in terms of style/content**

a. ...and other data like…

b. The stakes were high

c. Every required information

2. Problems in terms of language

a. In this article is presented an autonomous system able to conduct a medical test.

b. This test is used for diagnosis for patients who have troubles breathing like the muscle fatigue

c. The stakes were high as the goal was to not only gain time

d. We also used the Pepper Tablet to allow the doctor to enter every required information

e. ...answers given by the patient to edit a report….

V. Conclusion

This project was mainly about building an interface between various processes that were communicating between them. It is not ready to be deployed in real situation, for the results are not fully satisfying. But as an exploratory project, it is a success, since the system does check every constraint that have been mentioned.

We had the occasion to demonstrate the test in front of Dr. TROSINI-DESERT, who said the communication between pepper and the patient, and the way the different steps of the test followed each other easily were quite satisfying.

The most important measurable result was the measure of the distance walked by the patient. As we said in the distance measurement part, we have a satisfying result of an error < 1% of the real distance but the error could be reduced with better sensors and a more robust algorithm which could include more data of people walking.

1. Problems in terms of style/content

a. The results are not fully satisfying - were quite satisfying

b. As we said in the distance measurement part,...

2. Problems in terms of language

a. various processes that were communicating

b. check every constraint

c. We had the occasion

V. Improve the translation of executive summaries/abstracts

1.

***Résumé*—Un des principaux défis en robotique mobile est de développer un système de vision permettant à un robot de se localiser dans son environnement, de repérer des objets dynamiques et de partager ces informations aux autres robots avec qui il coopère. Ainsi, à partir d'une image captée par une caméra omnidirectionnelle, le système de vision recherche des balises pour déterminer la position actuelle du robot et des objets de couleurs contrastantes qui se déplacent dans son environnement. Plusieurs algorithmes de traitement d'image et de validation sont utilisés pour repérer les objets en plus d'un filtre de Kalman pour traiter les données et d'une architecture réseau client-serveur pour partager les informations.**

***Mots clés*—système de vision, caméra omnidirectionnelle, vision embarquée, système de localisation, traitement d'image, temps réel.**

Marleau, Sylvain. "Système embarqué de localisation et de perception pour un robot mobile." *Article de synthèse* (2004).

One of the principal challenges in mobile robotics is to develop a system with permanent vision to localize itself in its environment, to identify dynamic objects and share these informations with other robots with which it cooperates. That way, starting from an image captured by an omnidirectional camera, the system of vision recherches markers to determine the actual position of the robot and objects with contrasting colors that move in its environment. More algorithms that treat and validate images are used to localize the objects in addition of un filter of Kalman to treat data and a network architecture client-server to share informations.

2.

Techniques de réduction de la consommation dans les systèmes embarqués temps-réel

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Résumé : L'évolution actuelle des systèmes embarqués tend à leur faire intégrer une puissance de traitement de plus en plus importante tout en conservant, voir en améliorant, leur autonomie énergétique. Si depuis longtemps des techniques de diminution de la consommation ont été recherchées, elles deviennent maintenant primordiales dans l'élaboration d'un système embarqué.Ce document présente un certain nombre de techniques permettant de réduire la consommation énergétique. Certaines solutions sont purement matérielles, d'autres purement logicielles et d'autres enfin, appelées hybrides, nécessitent une collaboration entre une partie matérielle et une partie logicielle. Une de ces solutions hybrides est étudiée plus en détails : l'adaptation dynamique de la tension d'alimentation. Cette technique illustre l'impact que peut avoir une technique de diminution de la consommation sur un système ; dans ce cas précis, la modification de l'ordonnanceur d'un système temps-réel.

The actual evolution of embedded systems tends to grant them a computing power more and more important while conserving, even improving, their energetic autonomy. Even if a long time ago these techniques of the diminishment of the consommation have been researched, they now become paramount in the elaboration of an embedded system. This document presents a certain number of techniques permitting the reducing of the energetic consommation. Certain solutions are purely material, others purely based on software and others, finally, are called hybrids, necessitating a collaboration between a material part and a software part. One of these hybrid solutions is studied more in detail: the

dynamic adaptation of the supply voltage. This technique illustrates the impact that a technique can have for the diminishment of the consommation on a system. In this precise case, the modification of the (CPU) scheduler.

3.

Modélisation de la dynamique des territoires : méta-données et lacs de données dédiés à l'information spatiale Rodrique Kafando1,3, Rémy Decoupes 1, Lucile Sautot 2, Maguelonne Teisseire 1 1. TETIS, Univ Montpellier, AgroParisTech, CIRAD, CNRS, INRAE, Montpellier, France prenom.nom@inrae.fr 2. AgroParisTech, Montpellier, France lucile.sautot@agroparistech.fr 3. Montpellier Méditerranée Métropole, France

RÉSUMÉ. La gestion efficace d'un lac de données nécessite un système de gestion de méta-données performant. De nombreux travaux se sont penchés sur cet aspect en proposant des solutions. Néanmoins, peu de travaux se sont intéressés aux lacs de données dédiés aux informations spatiales. Pourtant, cette dimension géographique est fondamentale dès lors que l'on souhaite explorer les différentes trajectoires de projets d'aménagement au sein d'un même territoire. Dans cet article, nous nous intéressons tout particulièrement à la mise en oeuvre d'un lac de données pour la métropole de Montpellier. La solution conceptuelle proposée s'adosse à la norme ISO 19115 pour décrire des méta-données spatiales qui est étendue dans le cadre des lacs de données. L'implémentation basée sur HDFS et GeoNetwork est présentée et discutée. Le code source est également mis à disposition de la communauté.

The effective management of a data lake necessitates a management system of high-performance meta-data. Numerous works have studied this aspect, proposing solutions. Nevertheless, a few works have interested themselves in the data lakes dedicated to spatial information. However, this geographical dimension is fundamental once one wishes to explore the different trajectories of development projects within the same territory. In this article, we are interested particularly in the implementation of a data lake for the metropole of Montpellier. The conceptual solution leans on ISO 19115 to describe the spatial meta-data that has been rolled out in the frame of data lakes. The implementation based on HDFS and GeoNetwerk is presented and discussed. The source code is equally put at the disposition of the community.

4.

Epidémiol. et santé anim., 2005, 47, 15-33 Le recours à la modélisation en épidémiologie animal
LE RECOURS A LA MODELISATION EN EPIDEMIOLOGIE ANIMALE*
Philippe Sabatier 1., Dominique J. Bicout 1 Benoît Durand 2 et Marc A. Dubois 3

Le premier travail de modélisation en épidémiologie a été réalisé, à la fin du dix-huitième siècle, pour évaluer l'efficacité de la variolisation : nombre de morts évités et gain d'espérance de vie [Bernoulli, 1760]. En dépit des progrès remarquables de la biologie des maladies transmissibles, qui ont apporté de nombreux outils permettant de quantifier la diffusion des agents infectieux au sein des populations, le milieu vétérinaire (et médical en général) est resté longtemps réticent à l'utilisation de modèles mathématiques. Aujourd'hui, l'émergence et la persistance de nombreuses maladies infectieuses, posent des questions théoriques et pratiques qui ne peuvent être abordées sans une étude mathématique des dynamiques naturelles, et/ou contrôlées, des infections au sein des populations concernées. En prenant l'exemple de l'émergence de la fièvre de la vallée du Rift en Afrique sub-sahélienne, nous montrons que la modélisation de la transmission-diffusion d'une maladie permet de concevoir des outils de prévision épidémiologique et d'alerte précoce conformes aux préconisations de l'OIE, de la FAO et de l'OMS [S2E4 , 2001].

The first epidemiological modelling work was carried out at the end of the eighteenth century to evaluate the effectiveness of variolysis: number of deaths avoided and increase in life expectancy [Bernoulli, 1760]. Despite the remarkable progress in the biology of communicable diseases, which has provided many tools to quantify the spread of infectious agents among the population, the veterinary (and medical) field has remained for a long time recent in the use of mathematical models. Today, the emergence and persistence of many infectious diseases pose theoretical and practical questions that cannot be addressed without a mathematical study of the natural and/or controlled dynamics of infections in the populaons concerned. Taking the example of the emergence of Ri Valley fever in sub-