The Most Common Habits from more than 200 English Papers written by Graduate Chinese Engineering Students

By Felicia Brittman

This paper presents some of the most common Chinese-English habits observed from over two hundred English technical papers by Chinese writers. The habits are explained and in most cases, example text from an actual paper is given along with preferred text. An attempt is made to explain how to correct and prevent such mistakes. In some cases a possible explanation of why the habit occurs is also given. This paper can serve as an individual guide to editing technical papers especially when a native English-speaking editor is unavailable.

Introduction

Most Chinese universities require their doctoral and master candidates in technical and scientific fields to publish at least one English paper in an international journal as a degree requirement. However, many factors make this task difficult to accomplish. First, previous English studies may not have focused enough on writing, let alone technical writing. Current studies may not include English, causing the writers English fluency level to decline. Second, most writers have never lived in an English-speaking country. Third, due to the special aspects of technical writing, even native English-speaking engineering students have a technical writing course as part of their study.

Too often, students' papers are returned unaccepted because of poor English. If available, students may have their papers edited by a native English speaker. However, this can get expensive for a department that has many students with each paper typically needing to be edited twice. Hiring someone to edit papers is difficult, costly and only puts a patch over the problem. A native English speaker can do a good job at getting rid of most of the grammatical mistakes. However, if this person does not have a technical background, particularly in the area of the papers he is editing, he is unable to get rid of all of the mistakes and make sure that the meaning is clear. He cannot recognize the incorrect translation of technical terms for which there is a standard word. Such mistakes will not be picked up by the processor's spelling and grammar checker. In addition, if they are not familiar with the topic or field, they may not grasp the meaning of the entire article and fail to make critical edits.

Hiring a person with a technical background similar to that of the papers being edited is a better option. Nevertheless, while a person with a technical background may be able to edit the paper sufficiently, he may not be able to explain to the writer how to prevent such mistakes in the future. Besides, it is difficult for most Chinese universities to hire such staff simply for editing. Universities may consider inviting a visiting scholar who will edit papers in addition to doing research or teaching as part of an exchange.

Although editing may be the fastest way to publish papers, it does little in the way of teaching the writers how to prevent common mistakes and colloquial habits that prevent a clear understanding of the writer's ideas. Writers who have already obtained an

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impressing command of the English language can only truly benefit if they are made aware of their common mistakes and colloquial habits and how to prevent them.

Purpose

The purpose of this report is to introduce the most common habits in Chinese-English writing as noted from the over two hundred papers I have edited. The habits include grammar mistakes, colloquialisms, and formatting problems and in most cases prevent a clear understanding of the writer's ideas. A few of the habits, such as writing extremely long sentences, can be corrected with careful use of the MS Word® grammar and style checker. However, most habits, such as missing articles, go unnoticed by automatic grammar checking devices. Still, Chinese-English colloquial habits are not recognized by such software tools.

Structure

The common habits are presented in two sections. The first section lists the habits that, in my opinion, need the most attention. These habits interrupt the flow of the paper making it difficult to understand and occur most frequently. In this section, the habits are explained, example sentences from actual papers are given to show the habits, and the sentences are rewritten to show the correct way to write them. In the case of missing articles, a flow chart is also given to aid in choosing the correct articles.

In the second section, an additional list of habits is given. In some cases, example sentences are given. In other cases, advice is given. The second section is very useful in becoming familiar with small nuances.

Not all of the common habits I observed are presented mainly because they can only be dealt with on an individual basis. For example, writers had difficulty titling their papers and naming new technical ideas to express their contents and functions concisely. This problem frequently occurred but it can only be addressed individually. Once writers are aware of their habits, they would be able to write better technical English articles.

Section 1

"a, an, the"

The single most common habit is the omission of articles *a*, *an*, and *the*. This occurs because Mandarin has no direct equivalent of articles and the rules for using them are somewhat complicated for a non-native speakers.

Articles signal that a noun will follow and that any modifiers between the article and the noun refer to that noun (a big blue bicycle / the first award). *A* and *an* are indefinite articles; *the* is a definite article. Every time a singular noncount noun, a common noun that names one countable item, is used the noun requires some kind of determiner.

Mistake: *The*, *a*, and *an* are 1) omitted where they are required, 2) used where they are not needed or contribute to wordiness 3) used wrongly in place of the correct article.

Examples of incorrect usages:

Incorrect   Figure 2 shows the distribution of relative velocity on surface of main and splitter blades.[15]

Correct   Figure 2 shows the distribution of relative velocity on **the** surface of **the** main and splitter blades.[15]

Incorrect   The software PowerSHAPE is chosen to be **a** 3D modeling tool; it is good at dealing with free surfaces and curves.[4]

Correct   The software PowerSHAPE is chosen to be **the** 3D modeling tool; it is good at dealing with free surfaces and curves.[4]

There was only one 3D modeling tool used in this study, therefore '3D modeling tool' is specific and requires the article *the*.

Incorrect   A theoretical method for calculating the inner flow-field in centrifugal impeller with splitter blades and investigation of the interactions between main and splitter blades is presented in this paper. The vortices are distributed on the main and splitter blades to simulate the effects of flows. Systematical study of number and distribution of vortices is conducted.[15]

Correct   A theoretical method for calculating the inner flow-field in **a** centrifugal impeller with splitter blades and **an** investigation of the interactions between main and splitter blades is presented in this paper. The vortices are distributed on the main and splitter blades to simulate the effects of flows. **A** systematical study of **the** number and distribution of vortices is conducted.[15]

Incorrect   Theoretically, remanufacturing could fully take advantage of resources contained in EOF product thereby minimizing impact on environment to the greatest extent compared to landfill or recycling of materials; consequently it contributes greatly to resource conservation.[16]

Correct   Theoretically, remanufacturing could fully take advantage of resources contained in **an** EOF product thereby minimizing **the** impact on **the** environment to the greatest extent compared to landfill or recycling of materials; consequently it contributes greatly to resource conservation.[16]

Definitions:

Articles   Also called *determiners* or noun markers, articles are the words *a*, *an*, and *the*. *A* and *an* are indefinite articles, and *the* is a definite article. Articles signal that a

noun will follow and that any modifiers between the article and the noun refer to that noun. (a cold , metal chair/ the lightning-fast computer).

Determiners   A word or word group, traditionally identified as an adjective, that limits a noun by telling how much or how many about it. (expression of quantity, limiting adjective, marker) They tell whether a noun is general (*a* tree) or specific (*the* tree). *The* is a definite article. Before a noun, *the* conveys that the known refers to a specific item (*the* plan). *A* and *an* are indefinite articles. They convey that a noun refers to an item in a nonspecific or general way (*a* plan).

Common nouns	A noun that names a general group, place, person, or thing: *dog, house*.
Count noun	A noun that names an item or items that can be counted: radio, streets, idea, fingernails.
Noncount nouns	A noun that names a thing that cannot be counted: water, time.
Specific noun	A noun understood to be exactly and specifically referred to; uses the definite article the.
Nonspecific noun	A noun that refers to any of a number of identical items; it takes the indefinite articles *a* , *an*.

Very long sentences

Very long sentences are especially common in Chinese-English writing because the writers often translate directly from Chinese to English. Although, in Chinese writing it is acceptable to put several supporting ideas in on sentence to show their relationship, in English, the main idea and each supporting idea is typically written in separate sentences.

One can usually recognize a very long sentence by its length – sixty words or more. However, sentences of smaller lengths can also be too long if they contain multiple statements that confuse the main idea. Long sentences can be avoided by limiting each sentence to one or two topics. Semicolons should be used where the writer really wants to emphasize the relationship between ideas.

Too long   According to the characteristic of fan-coil air-conditioning systems, this paper derives the cooling formula of fan-coil units based on ~~the~~ heat transfer theories and puts forward a new method to gauge cooling named *Cooling Metering on the Air-side,* which can monitor the individual air-conditioning cooling consumption during a period of time by detecting the parameters of inlet air condition – temperature and humidity – of the fan-coil air-conditioning system as well as the parameters of inlet cooling water provided by the chiller.

Correct   This paper derives the cooling formula of fan-coil units based on the characteristics of fan-coil air-conditioning systems and heat transfer theories, and puts forward a new method to gauge cooling called *Cooling Metering on the Air-side*. The new method can monitor individual air-conditioning cooling consumption during a period of time by detecting the condition of inlet air – temperature and humidity – of the fan-coil air-conditioning system as well as the parameters of the inlet cooling water provided by the chiller.

Too long   The gear transmission is grade seven, the gear gap is 0.00012 radians, the gear gap has different output values corresponding to any given input value, non-linearity of the gear gap model can be described by using the phase function method, the existing backlash block in the non-linear library of the Matlab/zdimulink toolbox can be used, the initial value of gear gap in the backlash block is set to zero.[9]

Correct   The gear transmission is grade seven. The gear gap, which is 0.00012 radians, has different output values corresponding to any given input value. The non-linearity of the gear gap model can be described by using the phase function method. The existing backlash block in the non-linear library of the Matlab/zdimulink toolbox can be used; the initial value of gear gap in the backlash block is set to zero.

Another type of super-long sentence that frequently occurs in technical papers is that of a list. The writer wants to give a large amount of data, usually parameter values, and puts this information into one long, paragraph-sized sentence. However, the best way to give such type and quantity of information is to tabulate it (put it in a bulleted list).

Too long   …where m is the mass of the heavy disk mounted at the mid-span of a massless elastic shaft, e is the eccentricity of the mass center from the geometric center of the disk, ϕ is the angle between the orientation of the eccentricity and the ξ axis, k_ξ and k_η are the stiffness coefficients in two principal directions of shaft respectively, c is the viscous damping coefficient of the shaft and the disk, c_i is the inner damping coefficient of shaft, ω is the rotating speed, ξ_s and η_s are the components of initial bend in directions of ξ, η axes respectively: $\xi_s = r_b \cos\theta$, $\eta_s = r_b \sin\theta$.[1]

Correct   Where
   m is the mass of the heavy disk mounted at the mid-span of a massless elasticshaft,
   e is the eccentricity of the mass center from the geometric center of the disk,
   ϕ is the angle between the orientation of the eccentricity and the ξ axis,
   k_ξ and k_η are the stiffness coefficients in the two principal directions of the shaft,

c is the viscous damping coefficient of the shaft and the disk,

c_i is the inner damping coefficient of the shaft,

ω is the rotating speed,

ξ_s and η_s are the components of initial bend in directions of ξ, η

axes, respectively: $\xi_s = r_b \cos\theta$, $\eta_s = r_b \sin\theta$.

Too long	The clear height of the case is 6.15 meters; the thickness of the roof is 0.85 meters; the thickness of the bottom is 0.90 meters, the overall width is 26.6 meters, the overall length of the axial cord is 304.5 meters, the length of the jacking section is about 148.8 meters; the weight of the case is about 24127 tons.[3]

Clear

- Case clearance height   6.15 meters
- Roof thickness   0.85 meters
- Bottom thickness   0.90 meters
- Overall width   26.6 meters
- Overall length of the axial cord   304.5 meters
- Length of the jacking section   148.8 meters (approx.)
- Weight of the case   24127 tons (approx.)

Prefacing the main idea of a sentence by stating the purpose, location or reason first

Chinese writers often preface the main topic of a sentence by first stating the purpose, location, reason, examples and conditions as introductory elements. However, this has the effect of demoting the importance of the main idea and making the reader think the author is indirect. Bring the main idea to the beginning of the sentence stating any locations, reasons, etc., afterwards.

Incorrect	For the application in automobile interiors, this paper studies the nesting optimization problem in leather manufacturing. [5]
Correct	This paper studies the nesting optimization problem in leather manufacturing for application in automobile interiors.

Incorrect	Especially when numerical control (NC) techniques[4] are widely used in industry and rapid prototype methods[5][6] bring a huge economical benefits, the advantage of constructing 3D model[7][8][9] becomes extremely obvious.[2]
Correct	The advantage of constructing a 3D model[7][8][9] becomes extremely obvious especially when numerical control (NC) techniques[4] are widely used in industry and rapid prototype methods[5][6] bring a huge economical benefits.

Incorrect	Inside the test box, the space was filled with asbestos.[15]
Correct	The space inside the test box was filled with asbestos.

Incorrect	In practice, we employed this approach to dispose of a wheelhouse subassembly of one kind of auto-body, and the results show that this method is feasible.[16]
Correct	We employed this approach to dispose of a wheelhouse subassembly of one kind of auto-body, and the results show that this method is feasible.
Incorrect	To ensure sheet metal quality as well as assembly quality, CMMs are widely used in automotive industry production.[16]
Correct	CMMs are widely used in automotive industry production to ensure sheet metal quality as well as assembly quality.

Tendency of placing phrases which indicate time at the beginning of a sentence

Incorrect	When U is taken as the control parameter, the BDs for Δ=0.0, 0.001, 0.005 are shown in Fig. 8.
Correct	Figure 8 shows the BDs for Δ=0.0, 0.001, and 0.005 when U is taken as the control parameter.

Place the most important subject at the beginning of the sentence for emphasis

Incorrect	Based on the *triangulation structure* built from unorganized points or a CAD model, the extended STL format is described in this section.[4]
Correct	The extended STL format is described in this section based on the *triangulation structure* built from unorganized points or a CAD model.
Incorrect	The 3D dentition defect and restoration element models are designed precisely with complicated surfaces.[4]
Correct	The 3D dentition defect and restoration element models with complicated surfaces are designed precisely.

"which/ that"

The antecedent (noun or pronoun) to which *which* refers is not specific, causing confusion.

Antecedent   The noun or pronoun to which a pronoun refers.

'The Shijiazhuang south road underground bridge possesses the largest jacking force, which is built at 1978(10680t).' ['Shijiazhuang south road underground bridge possesses the largest jacking force which is built at 1978(10680t).'

Absolute truths in paleontology are often elusive, and even the filmmakers were surprised at the fierce arguments that split the scientists when an initial brainstorming session was else.

'Respectively' and 'respective'

Respectively refers back to two or more persons or things only in the order they were previously designated or mentioned. If two lists are given, respectively pairs the list entries according to the order in which they are given. In this case the use of respectively is to allow the writer to give a lot of information without confusing the reader or writing several short sentences. <u>Respectively is usually at the end of the sentence.</u> In both cases, mentioning the order must be important to the meaning of the sentence otherwise it is not used.

For example: Bobby, Nicole and Daren wore red, green and blue coats, respectively.

	List 1		**List 2**
	Bobby	wore	a red coat.
	Nicole	wore	a green coat.
	Daren	wore	a blue coat.

Respective to two or more persons or things only in the order they were previously designated or mentioned.

The uses of these two words are usually incorrect or confusing as in the following examples.

1. Respectively is misplaced in the sentence; it is put before the nouns to which it refers.

Incorrect   Equations 2～6 can be **respectively** linearized as:……(equations given)…[13]
Correct   Equations 2～6 can be linearized as:……(equations given)…, **respectively**.

Incorrect   The weights of the two experts are **respectively** 0.600 and 0.400.[19]
Correct   The weights of the two experts are 0.600 and 0.400, **respectively**.

2. Respectively is inserted to express that there is a certain order in which something was done. However, the order is already implied elsewhere in the sentence or does not need to be expressed because it does not add value to meaning of the sentence.

Incorrect   If both the core technology score and core quality score of a bottleneck process are**, respectively,** below certain scores, then we refer to strategy 1, otherwise, if either is**, respectively,** above a certain score, then we refer to strategy 2. Similarly, if the core technology and core quality are**, respectively,** above a certain score, then we refer to strategy 3, otherwise, if either is**, respectively,** below a certain score, then we refer to strategy 4.[19]

Correct   If both the core technology score and core quality score of a bottleneck process are below certain scores, then we refer to strategy 1, otherwise, if either is above a certain score, then we refer to strategy 2. Similarly, if the core technology and core quality are above a certain score, then we refer to strategy

3, otherwise, if either is below a certain score, then we refer to strategy 4.

Incorrect	Then, the rows of vortex due to both of the long and short blades are transformed into two singularities on the ζ-plane and integrate the induced velocity along the blades **respectively**.[20]
Correct	Then, the rows of vortex due to both of the long and short blades are transformed into two singularities on the ζ-plane and integrate the induced velocity along the blades.

3. In addition to 2, it is unclear to what 'respectively' refers.

Incorrect	The dynamic characteristics of a rotor with asymmetric stiffness or with initial warp have been studied before **respectively** [1-4]
Correct	The dynamic characteristics of a rotor with asymmetric stiffness or with initial warp have been studied before [1-4].

Incorrect	The inlet and outlet temperature of the air cooler were measured using two thermocouples **respectively**.[17]
Correct	The inlet and outlet temperature of the air cooler were measured by using two thermocouples.

'In this paper', 'in this study'

Two errors occur when these phrases are used. The first is overuse. In some papers written by Chinese, these phrases can occur as much as twice per page. In papers written by native English writers these phrases are reserved for primarily two uses
1. In the introduction and conclusion to emphasize the content of the paper.
2. In the body of the paper, after referring to work not done by the author such as in other journal articles or in standard.

Therefore, if either phrase occurs more than three times in a paper, its use is questionable. Actually, the reader is aware that the work presented is by the author (unless the author states otherwise) so there is no reason to repeat these phrases.

The second error is more subtle. The two phrases are interchanged.

Awkward	In this paper, IDEAS was used to ….
Correct	In this study, IDEAS was used to….

Awkward	In the paper, a SZG4031 towing tractor is used as the sample vehicle, it components equivalent physical parameters are obtained by UG design and testing.[9]
Correct	In this study, a SZG4031 towing tractor is used as the sample vehicle, it components equivalent physical parameters are obtained by UG design and testing.

The 'study' is the work the author/s did. The paper is the mode to present this work and is what the reader is holding/ reading. Keep in mind the writer can also use other phrases such as 'in this research', and 'this paper present'.

Numbers and Equations

Two very common errors are those concerning the presentation of Arabic numerals, and equations. Chinese writers usually write Arabic numerals instead of spelling out the word. The use of Arabic numerals, itself, is not an error however; they should never be used at the beginning of sentences.

Incorrect   **12** parameters were selected for the experiment.
Correct   **Twelve** parameters were selected for the experiment.

In addition, Arabic numerals are overused. Arabic numerals should be used to give data in technical papers, however they should not be used to give general information.

Incorrect   All **3** studies concluded that the mean temperature should be **30°C**.
Correct   All **three** studies concluded that the mean temperature should be **30°C**.

This probably stems from the fact that Mandarin is a symbolic language and not alphabetic. Thus, the writer will find it easier to write a symbol that expresses the idea instead of the word. This problem is even more serious when equations are used in place of words in a way that is not practiced by native English speakers. Consider the following examples.

Equations should be introduced as much as possible, not inserted in place of words. Most journals, like the *International Journal of Production Research*, discourage the use of even short expressions within the text.

Incorrect   If the **power battery SOC > SOC$_{lo}$** and the driving torque belongs to the middle load,…
Correct   If the **power battery SOC is greater than SOC$_{lo}$** and the driving torque belongs to the middle load,…

Incorrect   All **3** studies concluded that the mean temperature should be **30°C**.
Correct   All **three** studies concluded that the mean temperature should be **30°C**.

Format

Paragraphs
        A paragraph is a group of sentences that develop one topic or thought. Paragraphs are separated to indicate the end of one idea or thought and the beginning of another. All English paragraphs start on a new line with an indent of about one inch or

with an extra line between the two paragraphs. The latter is more typical for business writing.

Chinese students are often puzzled by separating paragraphs; the may perform one of two error. One error occurs when the writer fails to distinguish between two paragraphs. Although the new paragraph starts on a new line, there is no indentation, therefore, the reader in is not aware of the change in paragraphs or ideas. The second error occurs when a paragraph is preceded by a single sentence on a single line. The single line is indented along with the succeeding paragraph as in example #. This commonly occurs in Chinese texts but is never done in English.

'Figure' and 'Table'

The abbreviations for figure and table are Fig. and Tbl, respectively. However, the abbreviation of table is rarely seen in text. One can also write fig. for figure. However, one should choose one convention and use it throughout the paper. You should not switch between, Figure, figure, Fig, or fig. In addition, abbreviations are not used at the beginning of sentences and a space belongs between the word/ abbreviation and the number.

Incorrect   Figure.6, Figure6, Fig.6, Tbl10
Correct   Figure 6, Fig. 6, Tbl. 10

Variables

Variables, especially those of the English alphabet, should be italicized in technical papers to distinguish them from English words. Of course, this depends on the style required by the journal.

Capitals

Be careful that capitals are not in the middle of the sentence.

Incorrect   In table 1, The mark…
Correct   In table 1, the mark…

'such as' and 'etc.'

Such as and etc. are commonly misused by Chinese-English writers. Such as means 'for example' and implies that an **incomplete list** will follow; etc. means 'and so on' and is used at the end of a list to show it is **not complete**. Therefore, using such as and etc. together is redundant.

Incorrect   Studies of methodology and process of implementing remanufacturing mainly
            focus on durable products **such as** automobile motors, printers, **and etc**.[11]
Correct   Studies of methodology and process of implementing remanufacturing mainly
            focus on durable products **such as** automobile motors, **and** printers.

Such as means that an incomplete list will be given and should not be used when a complete list is given.

Incorrect	Compared to traditional industry, Micro-electronic fabrication has three characteristics **such as** high complexity, high precision and high automation.
Correct	Compared to traditional industry, Micro-electronic fabrication has three characteristics: high complexity, high precision and high automation.

Section 2

1) Some words have identical singular and plural forms and do not need an *s* added on to make them plural. These words include:
- *literature* (when referring to research)
- *equipment,*
- *staff* (referring to a group of people)
- *faculty*

2) Avoid redundancy in the following types of phrases frequently used by Chinese English writers

Instead of	Say	Or say
Research work	Research	Work
Limit condition	Limit	condition
Knowledge memory	Knowledge	Memory
Sketch map	Sketch	map
Layout scheme	Layout	scheme
Arrangement plan	Arrangement	plan
Output performance	Output	performance
Simulation results	results	simulation
Knowledge information	Knowledge	information
Calculation results	results	calculation
Application results	Results	Application

3) Certain words demand that the noun they modify is plural. These include *different*, *various*, and number words.

Don't write	Instead write
Different node	Different nodes
Various method	Various methods
Two advantage	Two advantages
Fifteen thermocouple	Fifteen thermocouples

4) Never begin an English sentence with abbreviations and Arabic numerals such as *Fig.* and *8*. Instead write *Figure* and *Eight*.

5) Do not write 'by this way'. Instead write 'by doing this', or 'using this method'.

6) Never write 'How to…' at the beginning of a sentence. (Don't say it ither.)

No   How to find the optimal parameter is the main objective.

Yes   Determining how to find the optimal parameter is the main objective.

7) Do write 'the results are **shown in** Figure 2'. Do not write 'the results are **showed as** Figure 2'.

8) Italicize variables appearing in the text to differentiate them from words. This is especially important when the variables are English alphabets. Write 'The graph shows t, a, and C as a function of time'. Do not write 'The graph shows t, a, and C as a function of time'.

9) Refrain from using the word obviously in a technical paper in the following way

No   Obviously, detecting regimes by means of PMH maps is a novel method.[8]

Yes   Detecting regimes by means of PMH maps is a novel method.[8]

10) International papers should not use location dependant terms such as 'at home', 'abroad', 'here', 'our country' because the reader most likely is not Chinese and not in China. Instead, write 'in China'.

11) Avoid overusing the phrases 'that is to say' and 'namely'. Instead, try to convey your meaning in one sentence.

12) Do not use 'too' at the end of a written sentence, especially in a technical paper.

Appendix A

1. LIN Fushen, MENG Guang, 'Dynamic Behavior of an Unbalanced and Warped Jeffcott Rotor with Asymmetric Stiffness', The State Key Lab of Vibration, Shock and Noise Shanghai JiaotongUnversity, Shanghai 200030, P.R. China, Institute of Vibration Engineering Northwester Polytechnic University, Xi'an 710072, CHINA, 2003

2. ZHANG Yuping, JIANG Shouwei, 'Review and Analysis of 3D-Model Reconstruction and Application', Shanghai Jiaotong University, School of Mechanical and Dynamic Engineering, 2003

3. DU Shouji, 'Long Distance Box-bridge Jacking Research: Report of Starting Research', Shanghai Jiaotong University, Shijiazhuang Municipal Traffic Project Provided a loan by World Bank, Contract number: TA3.1.4, 2003

4. ZHANG Wenqiang, YAN Heqing, HUANG Xuemei, WEI Bin, and WANG Chengtao, '3D Modeling and Rapid Prototyping for Dentition Defect Restoration', School of Mechanical Engineering, Shanghai JiaoTong University, Shanghai 200030, China, The Ninth People's Hospital, Attached to Shanghai Second Medical University, Shanghai 200011, China, 2003

5. ZHANG YuPing, JIANG Shouwei, YIN Zhongwei, 'A Generic Approach for Leather Nesting with an Heuristic Simulated Annealing Based Genetic Algorith', Shanghai JiaoTong University School of Mechanical & Dynamic Engineering, Huashan Road 1954, Shanghai, 200030, 2003

6. HU Xin, XI JunTong, JIN Ye, 'Shape analysis and parameterized modeling of a hip joint', Institute of Computer Integrated Manufacturing, Shanghai Jiaotong University, Post Code 200030, Shanghai, China, 2003

7. LI LiJun, JIN XianLong, LI YuanYin, WEI JinQiao, WU WeiWei, 'A Parallel Solver for Structural Modal Analysis', High Performance Computing Center, Shanghai JiaoTong University, Republic of China, 2003

8. CHEN YongGuo, TIAN ZiPing, MIAO ZhengQing, 'Application of Time-frequency Analysis to Fluidization Regimes Recognition in Circulating Fluidized Beds', School of Mechanical and Power Engineering, Shanghai Jiao Tong University, Dongchuan Road 800, Shanghai, P.R. China, 200240, 2003

9. REN ShaoYun, ZHANG JianWu, GAO ChangYun, 'Modeling and Simulation Analysis of the Torsional Vibration of a FR Driveline System', School of Mechanical Engineering, Shanghai Jiaotong University, 2003

10. WU LiJun, CHEN HuiEr, 'Mathematical Model for on-line Prediction of Bottom and Hearth of Blast Furnace by Particular Solution Boundary Element Method', Department of Power and Mechanical Engineering, Shanghai JiaoTong University, Shanghai, 200030, People's Republic of China, 2003.

11. JING XueDong, ZHANG GuoQing, PU GengQiang, WANG ChengTao, XU BinShi, ZHU Sheng, 'Study on Architecture of Remanufacturing System', School of Mechanical Engineering, Shanghai Jiao Tong University, Shanghai, China, Surface Engineering Institute, Beijing, China

12. CAI XiaoPing, JIN Chen, WU JunBiao, HIRAOKA Sumito, CHEN ShaoLin, 'Application of Partial Singular Value Decomposition Analysis to Location of Vibration Sources of Elevator', 1. State Key Laboratory of Vibration, Shock & Noise, Shanghai Jiao Tong University, Shanghai, China, 200030, 2. Fujitec CO., Ltd. Osaka, 547-8510, Japan, 2003

13. YE Yao, LIAN ZhiWei, HOU ZhiJian, 'Heat Exchange Analysis of Cooling Coils Based on a Dynamic Model', Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, Shanghai, 200030, China

14. NIU XinWen, DIN Han, XIONG YouLun, 'Assembly Plans Generation Based on Precedence Graphs', School of Mechanical Engineering, Shanghai JiaoTong University, Shanghai

200030, China, School of Mechanical Science and Engineering, Huazhong University of Science and Technology, Wuhan 430074, China

15. LIU ZhengHua, TONG TieFeng, 'Critical Heat Flux of Steady Boiling for Subcooled Water Jet Impingement on the Flat Stagnation Zone', School of Mechanical and Power Engineering, Shanghai Jiaotong University, Shanghai, 200030, P.R. China, 2003

16. WANG Jian, LIN ZhongQin, ZHANG YiZhu, 'Matching Clearance Analysis for Sheetmetal Assembly', School of Mechanical Engineering, Shanghai Jiao Tong University, 2003

17. DENG D. Q., XU L., Experimental investigation on the performance of an air cooler under frosting conditions, Institute of Refrigeration and Cryogenics, Shanghai Jiao Tong University, No. 1954 Huashan Road, Shanghai, 200030, P.R. China, 2002

18. YIN ZhongWei, JIANG ShouWei, Iso-phote based adaptive surface fitting to digitized points and its applications in region-based tool path generation, slicing and surface triangulation, 2003

19. GU ZhengLing, WANG LiYa, QIAN ShanYang, 'An AHP-based Method for Improving the Manufacturing Processes of Mass Customization', Industrial Engineering and Management Department, Shanghai Jiao Tong University, Shanghai 200030, P.R. China, 2003

20. XU Jie and GU ChuanGang, 'Numerical Calculation of the Flow-Field in a Centrifugal Impeller with Splitter Blades', School of Power and Energy Engineering, Shanghai Jiao Tong University, Shanghai 20003.

21. Zhu ZhengLi, YIN ChengLiang, ZHANG JianWu, 'Matching and Optimization of HEV Powertrain Based on Genetic Algorithm', School of Mechanical Engineering, Shanghai Jiao Tong University, Shanghai, 200030

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When to use **a**, **an**, and **the**

Start

Is the word a noun?
(person, place or thing)

→ yes

Is the noun singular?
(refer to only one thing)

→ no, plural

Is the noun countable?
Count   Non-count

→ no → end

→ yes

Is the plural countable noun already preceded by a determiner below?

some, any, both, many, more, most, few, fewer, the fewest, a lot of, a number of, other, several, all, all the

my, our, your, his, her its, their, nouns with 's or s'

these, those
no, two, three, etc.; the first, the second, the third, etc.

→ no → Is the plural, countable noun specific?

→ yes → 'the'

→ no → end

→ yes → end

Is the noun countable?
Count   Non-count

→ no → end

→ yes

Is the noun already preceded by a determiner below?

one, any some, every, each, either, neither another, the other

my, our, your, his, her, its, their, nouns with 's or s'

this, that

one, no, the first, the second, etc.

→ yes → end

→ no → Requires *a*, *an*, or *the*. Is the noun specific?

→ yes → 'the'

→ no → Does the noun begin with a consonant or a consonant sounding *h*? (i.e. house, half)?

→ yes → 'a'

→ no → The noun must begin with a vowel or vowel sounding *h* (i.e. hour, hierarchy) and therefore requires an 'an'.