学术论文写作和学术道德问题

范崇澄

电子工程系

Fellow, Optical Society of America

deefcc@mail.tsinghua.edu.cn

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做研究生的目的

学
硕
博

适

- 物理基础
- 数学基础
- 逻辑分析能力
- 实验动手能力
- 沟通能力
- 做人标准

写学术论文的目的

- 把自己做过的事情说清楚；
  - 最重要的成果
  - 最令人信服的论据
  - 最简练的文字（思路、逻辑）
- 增加人类知识库的内容（新）；
- 对经济建设有所贡献（好）；
- 与学术界（和一般公众）共享科学技术成果（诚信）；
- 满足任务与需求。

学术论文应回答的基本问题

- 研究了什么问题？
- 为什么要研究这一问题？
- 使用了什么方法？
- 为什么使用所述方法？
- 得到了什么结果？
- 比已有结果好在哪里？

如何写? (1)

- 有明确的创新点— 核心所在；
  - 不一定是原创，但必须是与众不同。
- 例：
  - 在原理和基本方法上没有创新。
  - 作者认为“对实验装置做了改进，降低了对光源的要求，避免了人工调偏振带来的误差”。但在文中没有支持上述结论实验。且在摘要和结论部分均未提及，只在引言部分提到。
  - 基于上述两点，该文作者认为“在国内首次报道了利用基于SPM连续波双频方法测量色散补偿光纤非线性系数的实验结果”意义不大。
  - 建议退稿。

如何写? (2)

- 不是做“导游”、“山重水复”、“自下而上”，而是“自上而下”、“会当临绝顶，一览众山小”，使读者“必读而后快”之情油然而生；
  - “种桃的快乐”和“吃桃的快乐”之不同。
- 图表在论文中的作用—使读者“眼前一亮”；
- 思路清晰、逻辑严谨、叙述简洁极为重要。

往哪投？

- 在本领域中学术水平高、读者面广、影响大的
  - SCI期刊
  - 国际学术会议
- 期刊选择
  - 强调新颖性的 Letters vs 强调系统性的 Jour. / Trans.
  - 不一定以影响因子为唯一依据
  - 连续投稿的好处
- 审稿周期问题
- 力争投向更高水平的杂志/会议
  - 风险！

SCI简介

- 以引用理科论文为主
- 影响因子I_F

$$I_{F\,N} = \frac{C_{N-2} + C_{N-1}}{P_{N-2} + P_{N-1}}$$

N-年份
P-发表文章数
C-被引用文章数

- 及时指数I_X

$$I_{X\,N} = \frac{C_N}{P_N}$$

- SCIENCE： $I_{F\,1996}=23.605$, $I_{X\,1996}=4.837$

SCI论文统计：’04 vs ‘00

	‘00	‘04
登录总篇数	61	97
I_F>0篇数A	56	90
平均 IF值	0.95	1.28
I_F>2.0篇数B	2	20
B/A (%)	3.6	20.6
I_F<1.0篇数C	24	45
C/A (%)	41.3	50

- ☺登录总篇数和I_F>0篇数均增加 **60%**。
- ☺ I_F>2.0篇数增至**10**倍，B/A 增至近**6**倍。
- ☺ I_F>3.0篇数由0篇增至**11**篇。
- ☹I_F<1.0篇数占I_F>0篇数比例(C/A)有所增加

电子系2005发表论文统计

- 发表论文总数 549 篇 (’06: 658)
  - 国际刊物 78 篇；国际会议 210 篇；
  - 国内会议及刊物 26 篇;全国刊物 235 篇
  - SCI收录 101 篇 (’06: 149)
- 申请专利 92 项，授权专利 38 项；
- 正教授57人，副教授45人，讲师 人
- 研究生~1200人：博士生320人，硕士生484人，工程硕士生393人。
- 大有潜力：在学术界/工业界获得承认的极为重要的方法。（专利：与标准直接相关或可cross liscence者）

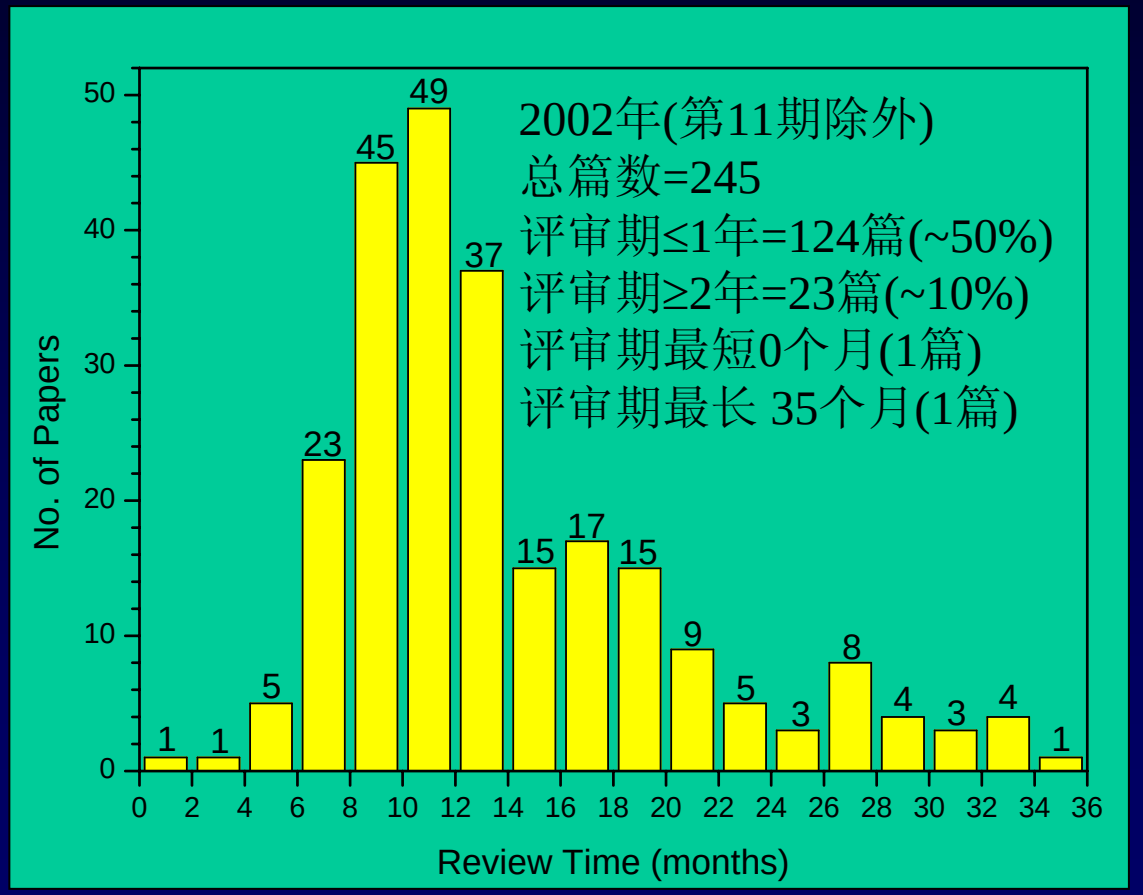
论文被引用情况

- 本系某博士生毕业时
  - 发表论文（第1作者）
    - OL(3.882) 3
    - OE(3.797) 2
    - IEEE PTL(2.552) 3
    - OFC 3
    - CLEO 2
  - 引用情况（第1作者）
    - IEEE PTL, 17, 1040, 2005: 5次
    - 同上, 16, 2284, 2004: 5次
    - OL, 29, 1333, 2004: 4次
  - 申请专利（第1发明人） 4项
- PR系列期刊110年来(1893/7~2003/5\6)发表的353, 268篇论文中
  - 被引用1000次以上者11篇
  - max 3267次，1965发表
  - 300次以上者237篇(0.07%)
  - 100次以上者2340篇(0.7%)。

高水平SCI期刊示例

IEEE Trans. Signal Processing

- SCI影响因子=1.268
- 平均篇长11.5印刷页。
- 给出负责联系评审每篇稿件的副主编人名。



“写”文章难 (1)

- **真有新观点吗？**
  - 基于对已有成果和设想（已发表/未发表）的经常、广泛、深入的研讨 (brain storming)；
  - 提法是否准确和明确？
    - 假设、条件等是否明确？如何说明其合理性？
    - 逻辑是否严密？
  - 如何证明其对？
    - 与本工作或他人的实验数据相符；
    - 与得到承认的理论或模拟方法的结果相符；
    - 有合理的物理解释并符合其unique规律；

“写”文章难(2)

- 必须严格遵守“严谨、诚实”的原则
- 符合格式
  - 一般规律（结构、语态）
  - 与刊物有关
- 反复修改
  - **Sharpening**: 使论点和论据最大限度地明确
  - “刻竹简” 原则: 使论文长度最大限度地压缩
- 语言问题（特别是SCI）
- 阅读有关“Scientific Writing”书籍

论 文 的 构 成

内　容	评审重要性
• 摘要（关键词）	1（含题目）
• 引言	
• 主体	3（含曲线）
• 结论	2 （含曲线）
• 致谢	
• 文献	3

论文的主要部分 I

- **摘要**
  - 用最短和最明确的语言说明本文的独特之点，以激发进一步阅读的兴趣。
  - 必需是 **informative**，绝不 能 descriptive！
  - 是全文最重要、也是最难写的部分！
  - 举例...

摘要举例(1)

公知事实

不要用第一人称

***Abstract*—Rayleigh scattering in the transmission fiber will degrade the noise performance of fiber Raman amplifiers. In this paper, we derived an analytical expression for the equivalent noise figure in a distributed fiber Raman amplifier, considering the impact of Rayleigh scattering in the transmission fiber. This analytical expression is used to analyze the impact of Rayleigh scattering on the noise performance of a distributed fiber Raman amplifier and educe the rule of pump power selection.**

***Index Terms*— Noise figure, Fiber Raman amplifier, Rayleigh scattering, Analytical expression**

罗嗦半天，最要紧的两点反而未提及

乌有

***Abstract*—An analytical noise figure expression for backward-pumped distributed fiber Raman amplifiers(BRFA) is derived, taking the influence of fiber Rayleigh scattering into account. The result agrees well with numerical simulation and experimantal data, and can be applied to pump power selection in BRFAs aiming at lowest noise figures.**

***Index Terms*— noise figure, distributed fiber Raman amplifier, Rayleigh scattering**

Chinglish

未提线性色散

摘要举例(2)

叙述次序混乱

- A novel tunable grating exhibiting a nonlinear equivalent chirp in a channel is designed and first fabricated. By employing the tunable grating, the dispersion of 50km single mode fiber is completely compensated in a 10Gb/s transmission system and the corresponding power penalty is -0.7dB. The grating has linear dispersion varying with the wavelength from -1070ps/nm to –250ps/nm within 1nm bandwidth. The equivalent chirp is formed through chirping the sampling function of a sampled Bragg grating. The sampling period is order of millimeter, which is easily controlled.

- A novel tunable grating exhibiting a nonlinear equivalent chirp and linear dispersion in a channel is designed and fabricated for the first time. The equivalent chirp is formed through chirping of the sampling function in a sampled Bragg grating. The sampling period is in the order of millimeter, which can be easily controlled. By employing the tunable grating, the dispersion of 50km single mode fiber is completely compensated in a 10Gb/s conventional fiber transmission with a power penalty of -0.7dB.

论文的主要部分 II

- 引言
  - 重要性；
  - 前人工作的客观评述（解决了哪些问题）；
  - 尚待解决的问题（就是本文要解决的问题）；
  - 本文采用的的基本方法和假设（限制）；
    - 必需不含糊地集中说明
    - 假设的正确性与合理性
  - 主体中各部分的构成（文章较长时用）。
  - 不要说前人不好。

论文的主要部分 III

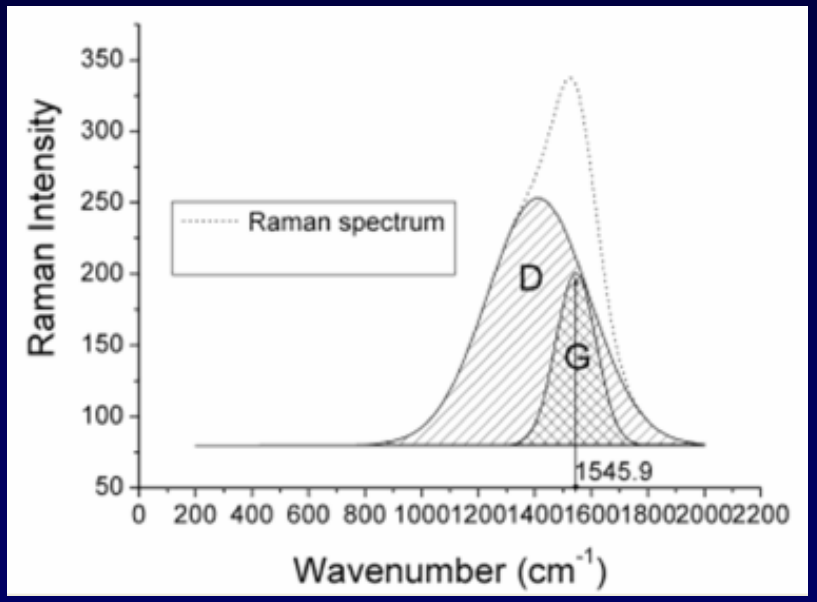
- **主体**
  - 涉及理论时，一定是物理+数学，而不是相反；
  - 理论（包括由前人公式出发）
    - 每个缩写名词在首次使用时一定要先写明全称；
      - 自造的缩略语宜少
    - (必需且仅在第一次时）说明每个符号的意义（即使众所周知）；
    - 不必详细推导以免物理不清；重要而复杂的推导可列于附录；
    - 主要步骤说明物理意义，繁杂推导可只给结果；
    - 最能说明本文成果的曲线
      - 与前人成果的不同及兼容性

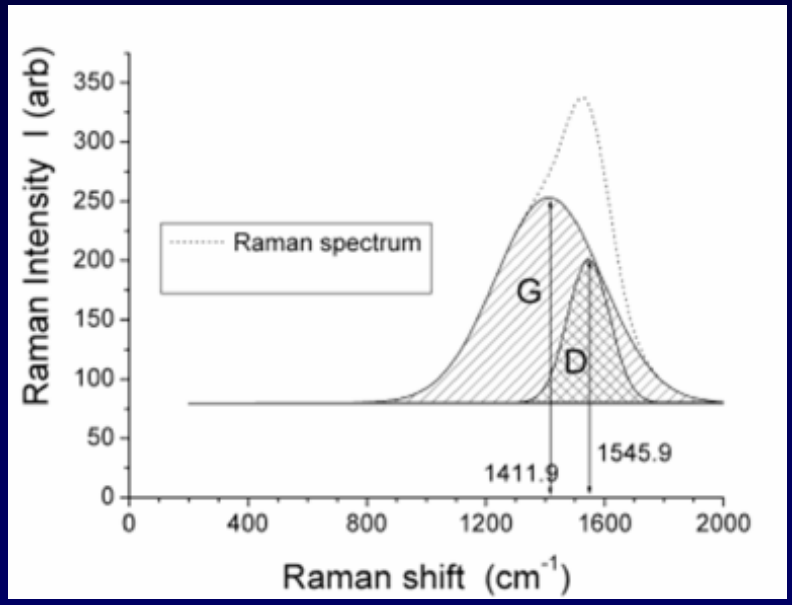
论文的主要部分 III

- **主体（续）**
  - 实验
    - 系统布置及主要元器件/设备的作用；
      - 按字母顺序排列解释元件/设备的缩略语
    - 实验条件
    - 最能说明成果的实验数据/曲线
      - 实验误差较大时应给出1σ 的误差界
    - 与理论的比较
      - 仔细说明 WHAT 和 WHY
  - 比较结论多层次
    - w/ same tendency，in（reasonable，satisfactory， good，very good，excellent）agreement w/ …

论文的主要部分 III

实验曲线





论文的主要部分 IV

- **结论**
  - 主要成果;
    - 比摘要部分更细致
    - 可以有一些预测/估计
    - 可以说具体优点，万勿笼统说好。
  - 应为未阅读过主体部分的读者看懂并理解。
- **致谢**
  - 要对文章的立意、理论、实验、结论、修改等有贡献的人适当地列入致谢名单。
  - 不要把应予致谢者作为文章作者。
  - The authors (are indebted to) (want to thank) (would like to extend their appreciation to)… for their (fruitful, stimulating, helpful…) discussions and helps (in...)

论文的主要部分 V

- **参考文献**
  - 严格遵守所投期刊和会议录的规定；
  - 按文献号递增顺序引用；
  - 作者，“论文全名”，期刊名，卷号，页号，年。
    - 作者；全体作者，第一作者 et al. (>=3) 排名问题
    - “论文全名”:可能不需要;
    - 期刊名: 全名或标准缩写;
    - 卷号: vol. 12, v. 12, **12** ,...
    - 页号: pp. 123-126, 123-126, 123,…
  - 重要文献一定要引！

语言问题

- 即使用母语写作，仍有语言问题
  - 书写简明、流畅、准确的学术论文的14步中，6步与语言有关。
- 高水平期刊评审者的不成文规则
  - 万万不要以为文字修改是编辑的事而在文中犯低级错误；
  - 语言上粗心的作者在研究上可能也是粗心的；
  - 也是对评审者的不尊重；
- 建议
  - 第三人称；
  - 被动语态。

学术道德问题

“学术腐败”愈演愈烈

- 形形色色的学术腐败
  - 低水平重复;
  - 粗制滥造;
  - 泡沫学术;
  - 假冒伪劣;
  - 抄袭剽窃;
  - 评奖立项.
- 对学术良心的扭曲
- 肇因和救治

发信站: BBS 水木清华站 (Wed Jul 18 23:10:57 2001)

科技界直面浮躁

- “浮躁瘟疫”袭击中国科技界.
  - “基因皇后”事件.
  - “核酸营养”事件.
- 论文多而成果太少.
  - “863”15年 1:30.
- 论文被引用次数少.
- 科技“浮躁”引发产业“泡沫”.
- 科研评议制度要改进.

为了远离“浮躁”，科技界已经达成共识：科学的诚实严谨既需要学者自律，也要有科学的管理和监督体制。

来源:·BBS 水木清华站 smth.org·[FROM: 61.174.136.8]

《关于科技工作者行为准则的若干意见》

科技部、教育部、中国科学院、中国工程院、中国科协

一九九九年十一月十八日

- 科技工作者要以实事求是的态度、严格的要求、严谨的方法对待科研工作。… …
- 不得为得出某种主观期望的结论而捏造、篡改、拼凑研究结果或者实验数据，也不得投机取巧、断章取义，片面给出与客观事实不符的研究结论。
- 未参加研究或者论著写作的人员，不得在论著中署名或者牟取其他不正当利益。严禁抄袭他人著作、论文或者剽窃他人科研成果的行为。

IEEE 道 德 法 规

IEEE Code of Ethics, www.ieee.org

- 根据已有数据作出结论或推论时诚实、实际。
- 寻求、接受并提供对于技术工作的批评，承认并改正错误。 恰当计入他人的贡献。

学术不端在写论文中的表现

- 制造(FABRICATION)
  - 编造数据或结果。
- 篡改(FALSIFICATION)
  - 改变或有意错报数据/结果。
- 剽窃(PLAGIARISM)
  - 把他人的概念、文字、数据、图表、曲线等成果据为己有而不加以引用。

后果

- 对公众——对科学价值之核心的沉重打击；
- 对个人——自毁前程
- 对单位所有人员——损失重大。
  - 一级学科排名第一的4项指标中学术声誉第一，是多年来师生共同努力的累计结果。

学术不端行为的处理

- 论文
  - 教师：无理由立即 resign。
  - 学生：
    - 毕业前：取消学籍
    - 毕业后发现：追回学位
  - 上“黑名单”，一定时期内全抵制该作者(组)论文

清华大学关于处理学术不端行为的暂行办法

- 学术不端行为的范围（与写论文有关）
  - 伪造或篡改数据资料、剽窃他人成果和提供虚假信息；
  - 不正确注明他人的学术工作和不适当的署名；
  - 使用不适当的统计或其它方法来夸大研究发现的重要性；
- 学术不端行为的处理
  - 对于严重的学术不端行为者（如蓄意伪造或篡改实验数据、研究结果…等，剽窃他人研究成果以及其它造成严重后果的不端行为），处以记大过以上的处分；对情节恶劣、造成极坏影响的予以解聘或开除。

-- 经2003～2004学年度第7次校务会议讨论通过 --

清华大学学生违纪处分管理规定实施细则

第二十七条

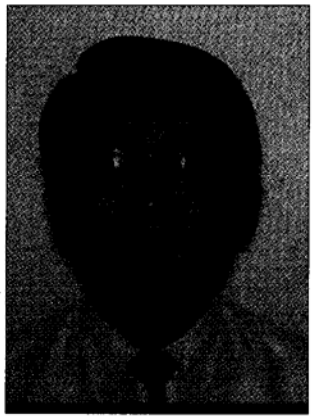
有剽窃、抄袭或者伪造实验数据、计算结果等学术不端行为的，给予记过或者留校察看处分；情节严重的，给予开除学籍处分。

以学术委员会等学术权威组织的认定作为学术不端行为的处理依据。

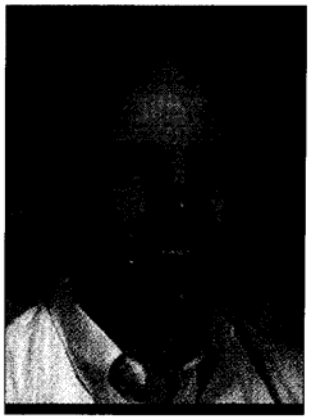
经2004-2005学年度第2次学生工作指导委员会会议讨论通过

学术失诚：例1

PLAGIARISM AND INTELLECTUAL PROPERTY



Editor-in-Chief
Geng-Sheng (G.S.) Kuo



Director of Magazines
Mark Karol

Plagiarism is stealing and using the ideas or words of someone else's work in such a way as to make it appear as one's own, without crediting the source. When an author signs an IEEE Copyright Form, the author "represents and warrants that the work is original and that he/she is the author of the work, except possibly for material such as text passages, figures, and data that clearly identify the original source, with permission notices from the copyright owners where required."

On behalf of *IEEE Communications Magazine*, we are sorry to report the following unfortunate plagiarism incident. On pp. 100–106 of the May 2001 issue, there is an article entitled "Management of Service Level Agreements for Multimedia Internet Service Using a Utility Model," co-authored by Jong-Tae Park, Jong-Wook Baek, and James Won-Ki Hong, that has a serious problem. After publishing the issue, we received a message from Professor Eric G. Manning (University of Victoria, Canada) stating that the article contained many things copied from their work. However, the article did not list any of Professor Manning's papers in the references. Plagiarism is a very serious matter, so we requested Professor Manning to make a detailed comparison between the article and their work and to document the similarities carefully. We also consulted our IEEE Intellectual Property Rights Office. Finally, after careful investigation, we confirmed that this was indeed a case of plagiarism. Elsewhere in this issue please find the comparison to demonstrate the fact.

Articles published in *IEEE Communications Magazine* are peer-reviewed, but unfortunately we did not discover the problems with this particular article before publication. We are very sad and deeply sorry to Professor Eric G. Manning, Dr. Shahadat Khan, Professor Kin F. Li, Lei Chen, and all readers. *IEEE Communications Magazine* is a high-quality, honest publication with high standards, and we do not tolerate or condone plagiarism. We requested the authors of the article to write a formal apology letter (which appears after the comparison) and return proper credit to the original authors. It is our strong intention to respect Professor Manning *et al.*'s research results and intellectual property.

Plagiarism is a dirty thing, that can kill people's innovative capability and hurt fair competition in research. In writing this message, we want to emphasize that *IEEE Communications Magazine* respects intellectual property rights and expects all authors to do likewise. In the research arena, respecting intellectual property helps protect authors' rights, achievements, and reputations, and stimulates the creation of new research results and innovative technologies that benefit our communications industry and readers of our magazine. In the future, we will continue to treat plagiarism as a serious matter so that *IEEE Communications Magazine* remains an honest and healthy journal, which can foster better research findings and technology advancements.

IEEE Communications Magazine, November 2001

学术失诚：例1

LETTER OF APOLOGY

DEAR PROF. MANNING, PROF. KIN LI AND DR. SHAHADAT KHAN,

With regard to the article "Management of Service Level Agreements for Multimedia Internet Service Using a Utility Model," which appeared in the May 2001 issue of *IEEE Communications Magazine*, we are very sorry that a part of the article, including the concept and description of the Utility Model, the mathematical notation, the key diagram, and the heuristic algorithm, was reproduced without proper referencing or acknowledgement of the original work. The Utility Model was originally described in Shahadat Khan's Ph.D. thesis [1] and published in Khan *et al.* [2], using the allocation of resources in a multimedia server to illustrate its use. A UNIX-based implementation and some experimental data were given in Chen *et al.* [3], and a patent application has been filed by Manning *et al.* describing its application to SLAs.

We would like to deeply apologize to Prof. Eric Manning and Prof. Kin Li of the University of Victoria, and to Dr. Shahadat Khan, for the distress and anger they experienced when they read the article published in the magazine.

Finally, we all confirm that both Jong-Tae Park and James Won-Ki Hong were unaware of this act of plagiarism, which was committed by Jong-Wook Baek.

Sincerely,

Jong-Wook Baek

Assistant Professor
Division of Internet Engineering
Dongseo University, Busan, Korea
Email: jwbaek@dongseo.ac.kr

Jong-Tae Park

Professor
School of Electrical, Engineering and Computer Science
Kyungpook National University, Daegu, Korea
Email: park@ee.knu.ac.kr

IEEE Communications Magazine, Nov 2001

学术失诚：例2

IEEE SPL主编给国内某大学4作者的信

- Full sections and figures have simply been copied. You have also had the audacity(厚颜) to claim that the presented algorithm is new and your own contribution.
- Essentially you have attempted to steal the work of B… and G… and present it as your own work.
- This amounts to plagiarism in its most severe form, and is one of the most serious crimes that can be committed in the international science community. Science progresses by carefully considering existing work and building on top of it, not by stealing someone else's work.
- The IEEE Signal Processing Society does not tolerate this behavior, and has installed a series of sanctions that must be applied in these situations.

学术失诚：例2

IEEE SPL主编给国内某大学4作者的信

- These sanctions apply to each of the co-authors, and essentially puts each of you on a blacklist for one year.
  - Immediate rejection of your submission SPL 293-2002.
  - Immediate rejection of all other submissions of each of the co-authors to any SPS publication: Journals, Conferences and Workshops organized by the IEEE SPS.
  - Prohibition of submission of any work to any of the IEEE SPS publications (Journals, Conferences, Workshops) against you (individually, together, or with other co-authors), for a duration of one year from today, 31 July 2002.
- I hope that this makes you realize the severity of your actions.

学术失诚：例3

ICCCN 2003 技术委员会共主席给系主任的信

- The Technical Program Committee for the conference has concluded this manuscript is an almost word-for-word copy of the paper "… …" by B…, D… and M… published at OPNETWORK 1998.

- Due to the seriousness of the matter, we have decided to also inform the head of the Department of Electronic Engineering at Tsinghua University of this occurrence. We know Tsinghua University to be a prestigious institution and are extremely troubled by this case.

- We are also troubled by the statement in the submitted manuscript that the work contained therein was supported by the National Fundamental Research Program (G1998030406) and National Science Foundation(60132010).

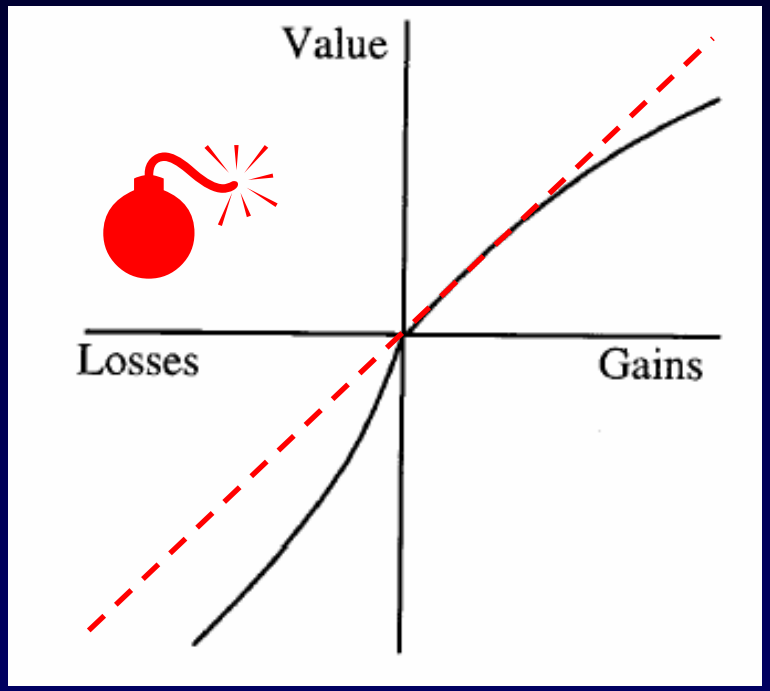
学术失诚：例3

ICCCN 2003 技术委员会共主席给学生的信

- Your act of plagiarism was foolish and reprehensible.
- However, another direct consequence of your plagiarism is that you have lost your credibility with me and, no doubt, others who are aware of this incident.
- It is difficult to regain credibility once it is lost. You can gain the respect of others and regain the respect of those that you have offended only through your future actions and deeds.

Prospect Theory

- 通过多年大量的心理调查研究得出：



红虚线表示“理性”决策
黑实线表示“非理性”决策.

王希勤，决策中的非理性陷阱，2004，11，21。

谢 谢