Work in Progress - Authenticating Authorship of Student Work: Beyond Plagiarism Detection

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Abstract - There are many types of academic dishonesty; deception, plagiarism, and even theft and fraud are among the most common. Many techniques have been developed to deal with dishonesty in classroom situations, but as instructional delivery increasingly migrates to online modalities, unique problems arise for the instructor in ensuring that the work performed by students represents that student’s efforts. When offering instruction in an any-time/any-place environment the challenges of ensuring authentication of student work appears to be almost insurmountable because it is difficult to gather students into a central location or prevent off-line communication or assistance from others. This presentation will address the challenges inherent in detecting academic dishonesty by examining a systems-approach to authentication of authorship of student work.

Index Terms – online learning, deception detection, cheating

INTRODUCTION

There are many forms of academic dishonesty, ranging from frankly illegal activities such as copyright infringement through institutional honor code violations such as copying the work of another student to “gray-area” issues such as taking credit for collaborative activities in which the student did not fulfill her or his role. Table I presents a representative list of forms of academic dishonesty identified in the literature [1]. In essence, the many faces of academic dishonesty all fall within the same domain; how can an instructor be sure that work submitted by a student is indeed an authentic representation of his or her efforts? Of even greater concern, however, is the indication [2] that the ways in which students engage in academic dishonesty are not only getting to be more varied, but the overall incidence of cheating is becoming increasingly more prevalent.

Technology has certainly made it much easier to cheat. The World Wide Web has made plagiarism ridiculously easy [4], while portable electronic devices such as cell phones and personal digital assistants have made unauthorized collaboration simple and very hard to detect [5].

For courses delivered in the more traditional, classroom-based environment there is at least one time-tested method for gaining some assurance that the work submitted by a student is indeed representative of her or his efforts. Using in-class examinations at which there are a large number of proctors, warnings against cheating, and multiple exam versions has been shown to effectively curtail cheating [3].

Courses delivered via an asynchronous, online modality offer additional challenges in detecting instances of academic dishonesty. In most cases, the instructor never meets the student and has little or no “known baseline” against which work submitted by the student can be compared. Oversight is markedly reduced. Students can use electronic means to cooperate in completing class work. E-mail, telephone and file sharing are all possible without the instructor being aware of the activity. While this type of collaborative learning is certainly not bad for assignments designed as team or group work, it is against the spirit and usually the letter of the policies in other cases.

AUTHENTICATING AUTHORSHIP

The problem of authenticating the authorship of work submitted by students cannot be addressed by a single-phase solution. A systems approach rather like that used in security – making the “costs” associated with penetrating the system exceed the perceived value of gaining access – seems to offer the most promise as a way to meaningfully address the problem. In essence, the cost-benefit ratio for cheating must be changed by: increasing the penalties attendant with cheating.

Table I

<table>
<thead>
<tr>
<th>Forms of Academic Dishonesty</th>
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<tbody>
<tr>
<td>• Collaborating on assignments</td>
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<td>• Copying all or part of assignments from another student</td>
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<tr>
<td>• Using the Internet to solicit assistance – chat rooms, news groups, discussion boards, etc.</td>
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<tr>
<td>• Submitting the same work for multiple courses</td>
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<tr>
<td>• Submitting the work of others from a previous version of the course</td>
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<tr>
<td>• Copying from another source, book, Internet, report, etc</td>
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<tr>
<td>• Stealing submitted work from instructor, computer or other source</td>
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<tr>
<td>• Paying for an assignment</td>
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<tr>
<td>• Hiring impersonator for an exam</td>
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<tr>
<td>• Using Crib notes or hidden resources during an exam</td>
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increasing the effort the student must expend to avoid
detection of cheating, and decreasing the effort the instructor
must expend to detect cheating. Some of the techniques
reported in the literature [6, 7, 8] and used by the authors
include the following.

Structure Assignments Carefully
– Emphasize synthesis of material rather than just
  reporting facts
– Provide narrowly focused topics for assignments
– Use collaborative assignments
– Iterative assignments
– Require a variety of information gathering activities
  • Surveys
  • Experiments
  • Interviews
  • Library research

Verify Student Identity
– Multifactor authentication
  • Use two of three identification factors
  • Something you know, are, and have
– Web-cams to record student environment and actions
– Embedding identifying information in the submission
  • Assignment submitted as sound files, permitting
    voiceprint verification
  • Require personal reflections

Build Benchmarks for Each Student
– ePortfolios that extend across multiple courses and
  terms
– Writing style analysis
– Variety of assignments with varying weights
– Getting to know a student’s “style” through a
discussion forum assignment
– Comparing discussion forum with more formal
  assignments

Proctoring
– Certification of work by a third party who
  • Knows the student
  • Is disinterested
– Time limits on assignments
  • Anytime, anyplace does not equal any pace
– Hidden text embedded in documents

Honor System
– Based on the premises that
  • Cheating is the result of ignorance
  • If expectations and requirements are clearly
    understood, cheating would fade
– In order for an honor system to work
  • Students must be educated
  • Expectations clearly articulated

CONCLUSIONS

The problem of certifying the authorship of work
submitted by a student, especially in courses offered in an
asynchronous, online environment, is both very real and
difficult to address. A single solution does not appear to be
possible for this problem, but a systems approach to altering
the cost-benefit equation for academic dishonesty does offer
promise. This solution does, however, require: a firm
commitment by the educational institution, the resolution of
the faculty to enforce the policies, and, ultimately, the
willingness of the students to work within the constraints of
the setting.

This project is attempting to develop methodologies
addressing the identification of authorship of student work in
the asynchronous environment. The research will evaluate
computer technologies that may be used to improve the
assignment authorship. Some of the approaches being
considered are speech recognition technology and its
integration into the on-line environment. The analysis of
writing style for student papers is another approach that is
being investigated. These and other methods may be able to
provide some approaches to dealing with student dishonesty
not amenable to current plagiarism checking methods.

REFERENCES

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