THINKPIECE

USING WYSH COMPUTER PROGRAMS TO MODEL
THE ALIEN TORT CLAIMS ACT

ERIC ALLEN ENGLE

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Richard T. Kinnie and in condolences for the Kinnie family whose kindness and
generosity opened my mind to the worlds of law and computers.
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This paper argues that an artificial intelligence algorithm can model some of the principles of civil procedure. The binary conditionals used in civil procedure – e.g., personal jurisdiction exists/does not exist – correspond closely to the Boolean logic used by computers. Modeling procedural rules on a computer is thus possible and possibly useful. To illustrate this thesis, this paper applies the WYSH computer programming language to the Alien Tort Claims Act and Torture Victim Protection Act.

I. WYSH: A DEDICATED COMPUTER PROGRAMMING LANGUAGE FOR ARTIFICIAL INTELLIGENCE IN LAW

Since WYSH is an internet based application it is globally available. WYSH enables a lawyer anywhere to model any law quickly and accurately using a computer. WYSH is an inference engine. Many inference engines exist on the market today. However, WYSH and PANNDIA (one of WYSH’s predecessors) are the only inference engines of which I am aware that specifically address the question of legal reasoning.

The WYSH engine is simple, globally accessible, and useful, though it does have some limitations. Any lawyer could easily learn to program in WYSH. Rulebases created in WYSH can be called from other rulebases anywhere in the world via the World Wide Web. WYSH also has an automatic English language parser, formats output and input dialogs automatically, and its output closely resembles standard English. Finally, WYSH is cost-free to users, thanks to the Australian National Research Council.

The WYSH engine automatically develops inferences from the rule base or case base which is supplied to it using forward chaining and backward chaining. Because WYSH automatically chains the inferences for the programmer, it simplifies greatly the task of programming. Furthermore, the syntax of WYSH resembles BASIC and Pascal, whose syntax closely resembles standard English. Because of these facts, WYSH is highly

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2 For a list of open source AI interpreters, see http://www-2.cs.cmu.edu/afs/cs/project/ai-repository/ai/areas/expert/systems/0.html (last visited Mar. 7, 2004).
accessible even to inexperienced programmers. A simple learning curve, tangible results, and global accessibility are why WYSH is worth investigating.

WYSH is a Perl program run through a common gateway interface (CGI). Therefore, a rule base can be made and hosted anywhere on the internet and call the WYSH CGI to process it. Further, different rule bases can call each other. Thus, in theory, several different jurists could develop different but interrelated rulebases in WYSH to represent whole areas of law. CGI’s do however run less rapidly than a locally hosted program. Compiling also may be a cause of slow execution. Slow execution leads to frustration when testing and debugging rule bases because the CGI must compile the program for each and every execution of the rule base. Since WYSH is simply a web front end for the YSH inference engine it may be possible to obtain the YSH backend and use that for testing and debugging. I have not yet however found a source for the YSH program. YSH is currently being upgraded to a new program AIDE, so some of the critiques and suggestions raised here may be being taken care of.

WYSH supports most simple control structures (IF... THEN... ELSE... ELSE IF; FOR...NEXT). End of line (return) rather than a semi-colon (;) indicates the conclusion of a statement. Function calls also are supported in WYSH. WYSH is not object oriented so FOR EACH is not supported. WYSH also does not have a Graphical User Interface (GUI). I do not see either of these as serious limitations for the modelling of small rulebases.

WYSH uses a quasi English syntax which seems similar to BASIC. WYSH also automatically generates dialogues. WYSH rulebases should be “isomorphic”, i.e. the text of a WYSH knowledge base should be as close as possible to the original legal text it models. In theory this isomorphism reduces the likelihood of typographical error or logical confusion and simplifies programmatic representation of law. Personally I find isomorphism neither a blessing nor a curse. However for new programmers isomorphism and automatic dialogue generation are strong points for WYSH because it can be an introductory language for lawyers (i.e. non-programmers). This simplicity speaks for using WYSH as an introduction to computer intelligence in law.

II. ARTIFICIAL INTELLIGENCE APPLICATIONS IN WYSH

I have written one case base and several small rulebases using WYSH to simulate a court facing a claim under the Alien Tort Claims Act (ATCA) and/or the Torture Victim’s Prevention Act (TVPA). I then ported the

rulebases both as separate entities and as one entire overview to metaCard’s Transcript scripting language, which was derived from Pascal / HyperTalk and also uses quasi-English for its instruction.

A. RULE BASED INFERENCE ENGINE (DEDUCTION)

The WYSH artificial intelligence engine allows the programmer to build either a rule base or a case base. A rule base is simply a series of rules that represent some area of knowledge – e.g., statutes. Rule based inferencing works via deduction – reasoning from general rules to specific cases. Deductive reasoning is the principle form of inference in the civil law. However, it is only a secondary form of reasoning in common law. Deduction does apply even within the common law to inferences from statutes. Thus, the rule based inference engine is better adapted to represent statutes. Case based reasoning in contrast reasons inductively from a series of known cases to the instant cases. Case based reasoning is appropriate for representing case-law.

The following rule bases simulate the findings that a court would meet under the Alien Tort Claims Act or Torture Victim’s Protection Act. Note that each of these modules can be separately run under WYSH simply by copying the text, exactly as it appears, and pasting it into the WYSH manual start page. The beauty of the WYSH engine is that it automatically chains each of the rules in one rule base so that each of these modules is automatically interrelated without having to be explicitly called by the user. A rule set is declared in this way:

RULE ruleName PROVIDES
  Statements
  conclusion

The following rules represent the Alien Tort Claims Act (ATCA), the Torture Victim Protection Act (TVPA) and various defenses developed in about a dozen cases. Each RULE indicator can run separately on the WYSH manual start page. The entire rule base can be run as one whole.

RULE ‘ATCA’ PROVIDES
  IF the defendant is an alien
  THEN
    IF the tort is a violation of the law of nations
    OR the tort is a violation of a treaty of the United States
    THEN
      U.S. courts have original jurisdiction

RULE TVPA PROVIDES
IF the defendant is an individual
AND the plaintiff has exhausted their remedies in the foreign nation
AND the U.S. ten year statute of limitations has not tolled
AND the plaintiff was subjected to torture or extrajudicial killing
AND the defendant had actual authority
OR the defendant had apparent authority
OR the defendant acted under color of law
THEN the defendant is liable in tort for the injuries to the plaintiff
ELSE the defendant is liable in tort for the injuries to the plaintiff

RULE 'tort defenses' PROVIDES
IF federal jurisdiction does not apply
OR government immunity applies
OR head of state immunity applies
OR exhaustion applies
OR comity applies
OR the claim is time barred
OR forum non-conveniens applies
OR political question doctrine applies
THEN defendant is not liable in tort
ELSE defendant may be liable in tort

RULE 'federal jurisdiction' PROVIDES
IF subject matter jurisdiction applies
AND personal jurisdiction applies
THEN federal jurisdiction applies
ELSE federal jurisdiction does not apply

RULE 'in personam jurisdiction' PROVIDES
IF specific jurisdiction applies
OR general jurisdiction applies
THEN in personam jurisdiction applies
ELSE in personam jurisdiction does not apply

RULE 'general jurisdiction' PROVIDES
IF defendant has systematic and continuous contacts to the United States
THEN general jurisdiction applies
ELSE general jurisdiction does not apply
RULE 'specific jurisdiction' PROVIDES
  IF original jurisdiction applies
  OR federal question applies
  THEN
    subject matter jurisdiction applies

RULE 'original jurisdiction' PROVIDES
  IF general jurisdiction applies
  OR personal jurisdiction applies
  THEN
    IF defendant is an alien
    THEN
      IF law of nations applies
      OR the tort is a violation of a treaty of the United States
      THEN
        original jurisdiction applies
      ELSE
        original jurisdiction does not apply
    ELSE
      IF defendant has systematic and continuous contacts to the United States
      THEN
        general jurisdiction applies
      ELSE IF defendant has minimum contacts to the U.S.
      THEN
        IF the tort occurred in the U.S.
        OR the tort has effects in the U.S.
        THEN
          personal jurisdiction applies
        IF general jurisdiction applies
        THEN
          personal jurisdiction applies
        ELSE
          personal jurisdiction applies
      THEN
        'in personam' jurisdiction applies

RULE 'law of nations' PROVIDES
  IF the underlying tort arises out of piracy
  OR the underlying tort arises out of genocide
  OR the underlying tort arises out of an illegal war of aggression
  OR the underlying tort arises out of a crime against humanity
  OR the underlying tort arises out of a conspiracy to commit war of aggression
  OR the underlying tort arises out of a conspiracy to commit a crime against humanity
  OR the underlying tort arises out of a conspiracy to commit genocide
  THEN
    the tort is a violation of the law of nations
the tort is not a violation of the law of nations

RULE ‘FSIA’ PROVIDES
IF the defendant is not a government
THEN government immunity does not apply

IF the defendant is a government
THEN IF there is an express waiver of governmental immunity

OR the act is purely commercial (actio iure gestionis)
THEN government immunity does not apply
ELSE government immunity applies

RULE ‘head of state immunity’ PROVIDES
IF the defendant is a head of state
OR the defendant is a governmental minister
THEN the defendant is not liable
ELSE IF the defendant is still serving in their ministerial capacity
THEN head of state immunity applies
ELSE head of state immunity does not apply

RULE ‘official immunity’ PROVIDES
IF the defendant is a civil servant
AND the defendant is in the term of his office
AND the act is a ministerial act
AND there is no waiver of immunity
THEN official immunity does not apply
ELSE official immunity applies

RULE ‘statute of limitations’ PROVIDES
IF the tort happens within the last ten years
OR equity tolls the statute of limitations
THEN the statute of limitations applies
ELSE the statute of limitations does not apply

RULE ‘forum non conveniens’ PROVIDES
IF this forum is oppressive to the defendant
OR this forum is an uneconomical choice when compared to competing fora
THEN forum non conveniens applies
ELSE

the claim is barred by the statute of limitations

RULE 'act of state doctrine' PROVIDES
IF the relief sought requires a U.S. court to declare
invalid the official act of a foreign sovereign performed in
its own territory
THEN
act of state doctrine applies
ELSE
act of state doctrine does not apply

RULE 'political question' PROVIDES
IF the issue has been committed to the executive or
legislature
OR there are no judicially manageable standards
OR it is impossible to decide the case without also
making a policy determination
OR the case requires unquestioning adherence
to a political decision already made
OR the court risks causing potential embarrassment by
creating multiple conflicting pronouncements from
different branches of government
THEN
political question doctrine applies
ELSE
political question doctrine does not apply

RULE 'comity' PROVIDES
IF principles of fairness indicate that a foreign court would be
more appropriate
OR judicial economy indicates that a foreign court
would be more appropriate
THEN
comity applies
ELSE
comity does not apply

RULE 'color of law' PROVIDES
IF the non state actor fulfils a public function
OR the nexus of state and non-state actor connections
are close
OR the private sector was compelled by the state to act
as it did
OR the action was undertaken jointly
THEN
The non state actor is considered to be a state actor for it
operated under color of public law
ELSE
the non state actor is not considered to be a state
actor for it did not operate under color of public law.

As we can see, this rule base is relatively complex. Logically, the first
inquiry should be whether jurisdiction exists. We must then inquire whether
a prima facie violation of the ATCA or TVPA exists. If so, we then consider
the half dozen procedural defenses which defendants can raise to thwart such
claims. If jurisdiction exists, and a *prima facie* tort exists under either the ATCA or TVPA, we then look at the defenses. If none of the defenses applies then a tort may exist.

**B. CASE BASED INFEERENCE ENGINE (INDUCTION)**

A case base is a representation of a series of cases. Case bases permit the computer to reason inductively, from the case rules provided to determine the outcome in the case being determined. Basically a case base should summarize a series of relevant cases. The engine then reasons from the known cases to determine what the outcome would be in the case provided by the user. Inductive reasoning, inferring from known cases to determine the outcome in a new similar case, is the principal form of reasoning in the common law. This is a form of analogical reasoning: aspects of known cases are compared to those of a new case. If those aspects are similar then the same rule used in the old cases will apply to the new cases.

The WYSH engine includes case based reasoning. The singular brilliance of this engine is that it allows a weighted comparison of factually similar cases to be used to determine whether a rule does or does not apply to a given case.

The following is the listing of the case base used to determine whether a case constitutes a violation of either the Alien Tort Claims Act or Torture Victim Protection Act. The code is fairly self explanatory. Each EXAMPLE is a new case in the case base. The names of the EXAMPLEs correspond to the name of cases litigating the ATCA or TVPA in U.S. courts. The conditionals (IF...THEN) are so the same as in standard English.

<table>
<thead>
<tr>
<th>GOAL RULE</th>
<th>defendant may be liable</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROVIDES</td>
<td>defendant may be liable</td>
</tr>
<tr>
<td>DETERMINE</td>
<td>defendant may be liable</td>
</tr>
</tbody>
</table>

**EXAMPLE An v. Chun**

provides defendant may not be liable

if defendant was present in the United States

and defendant was not a U.S. resident

and defendant was not kidnapped

and defendant state asserted its right to immunity

and defendant was a minister

and defendant was representing a state friendly to the United States

and defendant did not transact business in the United States

and defendant did not maintain an office in the United States

and defendant did not act as a commercial agent (acto jure gestionis)

AND defendant did not act as a sovereign (acto jure imperii)

EXAMPLE *Kadic v. Karadzic*\(^8\) PROVIDES defendant may be liable
IF defendant was present in the United States
AND defendant was not a resident in the United States
AND defendant was not kidnapped
AND defendant state asserted its right to immunity
AND defendant was a minister
AND defendant was not representing a state friendly to the United States
AND defendant did not transact business in the United States
AND defendant did not maintain an office in the United States
AND defendant did not act as a commercial agent (acto jureestionis)
AND defendant did act as a sovereign (acto jure imperii)

EXAMPLE *Filartiga v. Pena-Irala*\(^9\) PROVIDES defendant may be liable
IF defendant was present in the United States
AND defendant was a resident in the United States AND
defendant was not kidnapped
AND defendant state did not assert its right to immunity
AND defendant was a minister
AND defendant was representing a state friendly to the United States
AND defendant did transact business in the United States
AND defendant did maintain an office in the United States
AND defendant did not act as a commercial agent (acto jureestionis)
AND defendant did act as a sovereign (acto jure imperii)

EXAMPLE *Amica Hess\(^10\) PROVIDES defendant may not be liable
IF defendant was not present in the United States
AND defendant was not a resident in the United States AND
defendant was not kidnapped
AND defendant state asserted its right to immunity AND
defendant was a minister
AND defendant was representing a state friendly to the United States
AND defendant did not transact business in the United States
AND defendant did not maintain an office in the United States
AND defendant did not act as a commercial agent (acto jureestionis)
AND defendant did act as a sovereign (acto jure imperii)

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8 70 F.3d 232 (2d Cir. 1996).
9 630 F.2d 876 (2d Cir. 1980).
EXAMPLE Sampson v. Germany\textsuperscript{11} PROVIDES defendant may not be liable
IF defendant was present in the United States
AND defendant was not a resident in the United States AND defendant was not kidnapped
AND defendant state asserted its right to immunity AND defendant was not a minister
AND defendant was representing a state friendly to the United States
AND defendant did transact business in the United States
AND defendant did maintain an office in the United States
AND defendant did not act as a commercial agent (acto jure gestionis)
AND defendant did act as a sovereign (acto jure imperii)

EXAMPLE U.S. v. Noriega\textsuperscript{12} PROVIDES defendant may be liable
IF defendant was present in the United States
AND defendant was not a resident in the United States AND defendant was kidnapped
AND defendant state did not asserted its right to immunity
AND defendant was a minister
AND defendant was not representing a state friendly to the United States
AND defendant did transact business in the United States
AND defendant did not maintain an office in the United States
AND defendant did act as a commercial agent (acto jure gestionis)
AND defendant did not act as a sovereign (acto jure imperii)

EXAMPLE Doe v. Unocal Corp.\textsuperscript{13} PROVIDES defendant may be liable
IF defendant was present in the United States
AND defendant was a resident in the United States
AND defendant was not kidnapped
AND defendant state asserted its right to immunity
AND defendant was not a minister
AND defendant was representing a state friendly to the United States
AND defendant did transact business in the United States
AND defendant did maintain an office in the United States
AND defendant did act as a commercial agent (acto jure gestionis)
AND defendant did not act as a sovereign (acto jure imperii)

EXAMPLE Doe v. Unocal Corp.\textsuperscript{14} PROVIDES defendant may not be liable
IF defendant was not present in the United States
AND defendant was not a resident in the United States

\textsuperscript{11} 250 F.3d 1145 (7th Cir. 2001).
\textsuperscript{12} 117 F.3d 1206 (11th Cir. 1997).
\textsuperscript{13} 248 F.3d 915 (9th Cir. 2001).
\textsuperscript{14} 248 F.3d 915.
AND defendant was not kidnapped
AND defendant state asserted its right to immunity
AND defendant was not a minister
AND defendant was not representing a state friendly to the United States
AND defendant did transact business in the United States
AND defendant did not maintain an office in the United States
AND defendant did act as a commercial agent (acto jure gestionis)
AND defendant did act as a sovereign (acto jure imperii)

EXAMPLE *Saudi Arabia v. Nelson*\textsuperscript{15} PROVIDES defendant may not be liable
IF defendant was present in the United States
AND defendant was not a resident in the United States
AND defendant was not kidnapped
AND defendant state asserted its right to immunity
AND defendant was a minister
AND defendant was representing a state friendly to the United States
AND defendant did transact business in the United States
AND defendant did maintain an office in the United States
AND defendant did not act as a commercial agent (acto jure gestionis)
AND defendant did act as a sovereign (acto jure imperii)

EXAMPLE *Amerada Hess*\textsuperscript{16} PROVIDES defendant may not be liable
IF defendant was present in the United States
AND defendant was not a resident in the United States
AND defendant was not kidnapped
AND defendant state asserted its right to immunity
AND defendant was not a minister
AND defendant was representing a state friendly to the United States
AND defendant did not transact business in the United States
AND defendant did not maintain an office in the United States
AND defendant did not act as a commercial agent (acto jure gestionis)
AND defendant did act as a sovereign (acto jure imperii)

Again, as can be seen, the PANNDDA engine forces us to consider each element of the case as having a value even where the facts were such that in the actual case no such value existed or was relevant. Similarly the UNOCAL case had to be split into two parts since it held that UNOCAL could be liable but SLORC could not. Further one could easily disagree with the characterizations I assigned to *Doe v. Unocal* (SLORC): was SLORC only engaging in a sovereign act? Or was it only a commercial actor? Or was it both a commercial and sovereign actor? Is Myanmar a regime friendly to the United States? Is it a regime unfriendly to the United States? Should that

\textsuperscript{15} 507 U.S. 349 (1993).
\textsuperscript{16} *Amerada Hess*, 488 U.S. 428.
status even be considered? That factor – whether a foreign state is legally “friendly” to the United States – seems to be an example of creeping legal realism. A realist would note that in the cases where a close U.S. ally is involved liability is not found, but in cases where the *locus delicti* happens to be a state either not friendly to or even unfriendly toward the United States that liability is more likely to be found. In other words, simply because we can make a model of the law does not mean our model is necessarily right. That problem is compounded where debugging is hindered by the CGI's slow response time. Slow CGI response time does force the programmer to be disciplined however and so is not entirely a bad thing.

III. **Practical Applications of WYSH Programs: The Use of AI as a Tool to Reduce Legal Complexity**

Lawyers would principally find WYSH and similar artificial intelligence useful for diagnostic work and more particularly as a way to avoid missing easy but obscure arguments. A well written WYSH program will force the lawyer to ask questions which s/he might otherwise overlook and thus raise potential defenses or lines of attack which they might not remember to raise at trial. For example, the civil procedure WYSH program will force the lawyer to remember each step in the determination of federal jurisdiction. These kinds of checklists already exist on paper of course but they may be more interesting if the lawyer is forced to go through them systematically and prompted to consciously formulate explicit answers to what might seem quite inconsequential factual questions. WYSH can also generate documents automatically (such as wills or contracts) based on user input.  

IV. **Conclusion and Future Prospects**

Computer applications in law have expanded from simple word processing to electronic research and trial aids (primarily animation). There have been relatively few applications of artificial intelligence to law. This is partly because AI is still a developing technology. Expert systems generally answer limited tasks reasonably well, but AI general systems have not yielded much success. AI, unlike other areas of programming, has not yet yielded profits. AI algorithms do increasingly figure in commercial programs. AI can be useful not only as a tool to teach legal reasoning to law students, but also as a source for automated document generation (principally contracts and wills) and “checklists” for legal practitioners.

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