ThinkPiece

Using WYSH Computer Programs to Model the Alien Tort Claims Act

Eric Allen Engle[*]

USING **WYSH** COMPUTER PROGRAMS TO MODEL THE ALIEN TORT CLAIMS ACT

ERIC ALLEN ENGLE

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[1]

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.[2] However, WYSH and PANNDA (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

---

[1] For a brief introduction to WYSH, see http://www.austlii.edu.au/austlii/wysh (last visited Mar. 7, 2004).

[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).

Field Code Changed

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,[3] 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

---

3   Caroline White, *Artificial Intelligence to Give Lawyers a Run for Their Money*, dotJournalism, May 3, 2001, *at* http://www.journalism.co.uk/ezine_plus/dotjark/story231.shtml (last visited Mar. 7, 2004).

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),[4] the Torture Victim Protection Act (TVPA)[5] and various defenses developed in about a dozen cases. Each RULE indicator can run separately on the WYSH manual start page.[6] 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

---

4   28 U.S.C. § 1350 (1789).
5   Pub. L. No. 102-256, 106 Stat. 73 (1992).
6   *See* http://aide.austlii.edu.au/wysh/wyshstart.html (last visited Mar. 7, 2004).

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

RULE 'in personam' PROVIDES
      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

      IF   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

            ELSE
                    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 (acto 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 INFERENCE 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.


```
GOAL RULE defendant may be liable PROVIDES
DETERMINE defendant may be liable

EXAMPLE An v. Chun[7] 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)
```

---

7   1998 U.S. App. Lexis 1303 (9th Cir. 1998).

            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 jure
                 gestionis)
          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 jure
                 gestionis)
          AND
                 defendant did act as a sovereign (acto jure imperii)

EXAMPLE *Amerada 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 jure
                 gestionis)
          AND   defendant did act as a sovereign (acto jure imperii)

---

8   70 F.3d 232 (2d Cir. 1996).
9   630 F.2d 876 (2d Cir. 1980).
10   Argentine Republic v. Amerada Hess Shipping Corp., 488 U.S. 428
(1989).

EXAMPLE *Sampson v. Germany*[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*[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.*[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.*[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

---

11   250 F.3d 1145 (7th Cir. 2001).
12   117 F.3d 1206 (11th Cir. 1997).
13   248 F.3d 915 (9th Cir. 2001).
14   248 F.3d 915.

Deleted: th

Deleted: Doe v. Unocal Corp., 2000 U.S. Dist. LEXIS 13327 (2000)

Deleted: Doe v. Unocal Corp., 2000 U.S. Dist. LEXIS 13327 (2000)

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*[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*[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 PANNDA 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

---

15   507 U.S. 349 (1993).
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.[17]

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.

---

[17]   *See, e.g.*, http://www2.austlii.edu.au/~graham/wysh/wysh_will.html (last visited Mar. 7, 2004).

Field Code Changed