White Paper Proposal                                      Dr. Leila Anne Breene

                                                         ArcoLogix

**Title: The Ethical Use of Artificial Intelligence in the IoT Connected Home**

The last white paper we worked on touched lightly on the Ethics of AI. We would like to propose an additional white paper that goes farther into the Ethical Use of Artificial Intelligence with respect to the IoT Connected Home. Given the current uses/abuses of AI we feel that this paper is timely. Facebook is not regulated and is affecting freedom of speech and politics, Google has no idea what its computers are doing, and Cambridge Analytica has influenced the BREXIT vote in the UK as well as the Presidential Election in 2016 (continuing today).

There are efforts in academia and business to support the ethical use of AI: the IEEE has a working group addressing this; the Ethical Corporation in Europe -- a collection of corporations -- a consortium – looking into what it means to be an ethical entity; the EU's GDPR (which has not been fully implemented in the US) represents a huge step in the right direction; there is a group of "White Hat AI" folks in the Northeast US attempting to reign in the Russian interference in our politics; finally there is the XAI – Explainable AI -- US government project mentioned in the first paper. A discussion of what each group has accomplished would be helpful to our effort.

With the IoT Connected Home we must be risk averse. We want to get it right the first time. There are three issues we would like to address in this paper: ethics, privacy and security.

The following comes to mind:

1) Ethics
   a) As applied to the use of users' data, email, health data, spending and finances (and anything I have missed). Ethical use of users' data would include full disclosure of the ways this data is used, what the entity makes financially from the use of this data, and to whom the data is sold and in what form.
   b) Using smart assistants capable of understanding speech, recording it and performing tasks the user has given them, must be used together with full discloser and contracts describing what can be done with the recordings, how long to keep them, etc.
   c) The use of connected entities (companies) should be contractually defined and accepted by both parties. For example, the electric company must not indiscriminately disconnect service without complying with an agreed upon process that both parties have accepted.

2) Privacy
   a) All user data should be private, as should recordings. There has already been a murder case in which the recordings of (Alexa?) were subpoenaed. There was nothing useful to the prosecution, so the recordings were not used. This time.

    b) I believe Facebook Messenger saves all messages and sells them – this could be true of Google, Microsoft, etc. The only regulations on privacy in the US are those concerning health records.

    c) Hackers are targeting 'smart' devices more frequently. Depending on the complexity of the home systems, this could become very dangerous.

    d) My neighbors' Router was hacked, and their bank account emptied. Many Routers have known passwords, and their owners often don't know this nor how to reset them. In fact, the technical ignorance of most users is a major concern. We cannot expect everyone to be a geek.

3) Security (and Safety)

    a) AI can be the answer to keeping the home secure. That blended with a Bluetooth Network inside the Gateway to communicate with the Smart devices. This could limit hackers to the outside of the home.

    b) Smart devices can be hacked as well. Suppose a hacker targets a washing machine and sets it to fill the tank with no cutoff. This could cause significant damage to the home. Or suppose the target is the HVAC and the temperature is set to below freezing in the middle of winter. Suppose a fire starts or is started, and the wrong number is programmed in to the fire company.

    c) Testing is extremely important. It must be included as part of the design. The IEEE group working on the Ethics of AI brought up the following example in autonomous vehicle testing: a slight change to a stop sign (like a small graffiti image) caused the vehicle to mis-recognize the sign as a stop sign and career into the road without stopping. There are over 400 "Hubs" (operating systems) currently available for the Connected Home.