



ROS-Industrial Program Description

Background

The Robot Operating System (ROS) open source software program, originally established by Willow Garage, and now maintained by Open Robotics, provides libraries and tools to help software developers create robot applications. For example, ROS provides hardware abstraction, device drivers, algorithm libraries, visualizers, message-passing, package management, and more. The BSD¹ license makes the software free for others to use, change, and incorporate into commercial applications. The primary goal is to enable software developers to build more capable robot applications quickly and easily on a common platform². Since its initial release, there have been 11 releases including the latest May 2017 version, Lunar. To date, the acceptance of ROS has been broad within the academic, research, and start-up communities. The number of software development packages has grown rapidly from March 2010, and today totals more than 3,000.

Over the last two decades, university and research laboratories have traditionally focused on building advanced capabilities for defense and service robots. ROS now includes many of the current state-of-the-art planning, perception, and manipulation capabilities. However, up until the launch of ROS-Industrial these research advancements have not been transitioning, in a comprehensive way, for use with industrial robotics and automation.

Need

ROS is quickly showing capability for new commercial applications as it matures. Southwest Research Institute® (SwRI®) adopted ROS early and has been successfully leveraging it for industrial robotics applications. Seeing the power and capability of ROS, SwRI established ROS-Industrial: a common industrial control platform that facilitates technology transfer from research labs to industry. ROS-Industrial is only the first step in establishing a community for development of advanced robotics capabilities for industry. The success of ROS-I critically depends on broad community involvement from end users, accessory manufacturers, robot manufacturers, integrators, researchers, educators, and government to prioritize new ROS-Industrial capabilities and application templates. There are software development, standards development, documentation, technical support, and training activities necessary to deploy ROS-Industrial broadly and in robust applications.

Path Forward

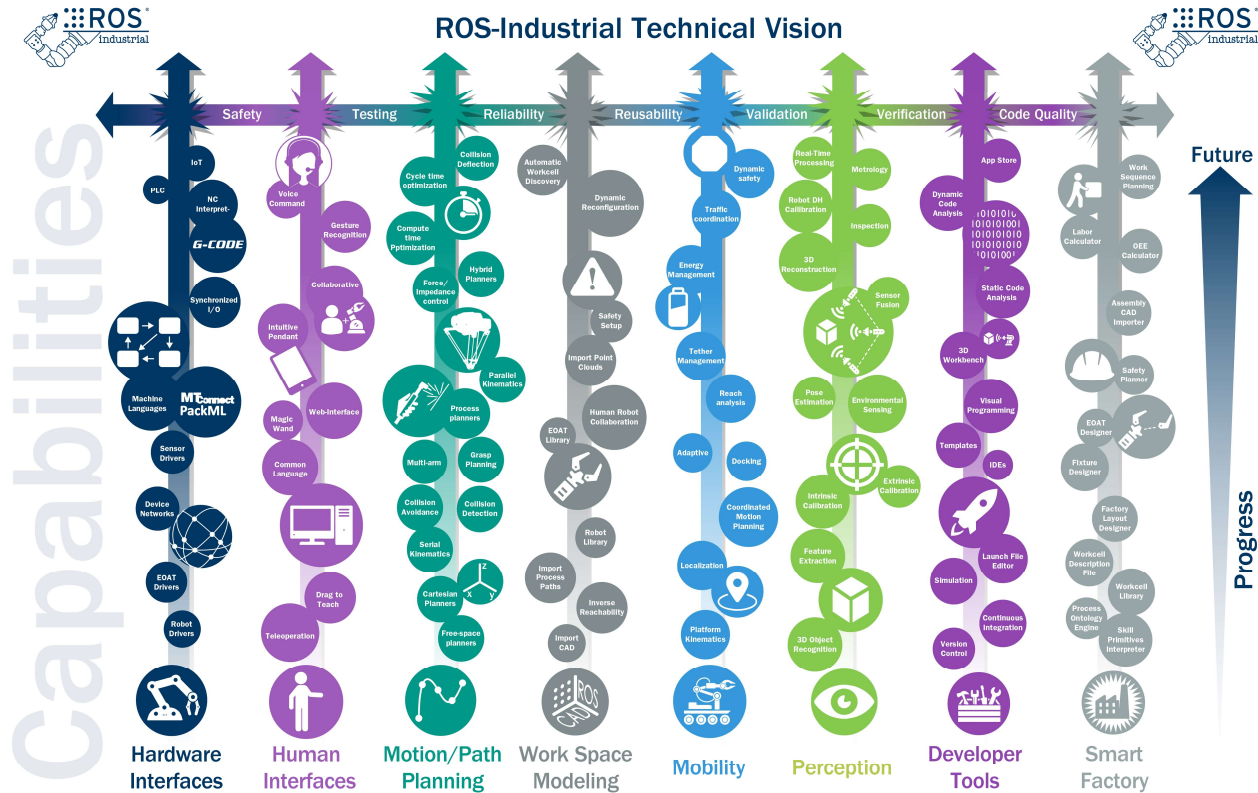
Industry collaboration to solve common problems is a natural way to address the need, wherein participants share the development cost and benefit from community ideas and involvement. Following other successful open source projects as models, SwRI has initiated a precompetitive commercial collaborative research consortium, exclusively focused on the needs of industrial robot users, called the ROS-Industrial Consortium (RIC) Americas. The RIC, which is now over 60 members strong globally³, also enables collaboration through the sister consortia that are led by Fraunhofer IPA, RIC – European Union, and the Advanced Remanufacturing and Technology Centre in Singapore, RIC – Asia-Pacific. The RIC will accelerate the further development of ROS-Industrial. Members will work together to develop an application roadmap for ROS-Industrial, set near-term technical goals, and participate in spinoff Focused

¹ <http://www.opensource.org/licenses/BSD-3-Clause>

² <http://www.ros.org/about-ros/>

³ <https://rosindustrial.org/ric/current-members/>

Technical Projects (FTPs). The current Technical Vision, below, is presented to illustrate the ROS-Industrial capability and a qualitative timeline for development.



Vision

Create an open community and common software repository where researchers, robotics professionals, and industrial controls experts can contribute robust and reliable manufacturing-related ROS software, combining the relative strengths of ROS and existing technologies (i.e. combining ROS high-level functionality with the low-level reliability and safety of industrial robot controllers). Over time ROS-Industrial will be positioned to become the leader, and standard, in advanced robotics software by presenting a new way to solve complex challenges through the democratization of tools and capabilities, thus driving end-user value through new capability leverage, and solution provider value by focusing on the new capability creation versus recreation of interfaces and building blocks.

Mission

The mission of the Consortium is to accelerate the development of ROS-Industrial by:

- Managing a roadmap to identify and prioritize ROS-Industrial capabilities for industrial robotics and automation as defined by the user community to address its current and future applications problems.
- Instituting and enforcing code quality standards appropriate for an industrial software product. These include rating/tracking code quality metrics, multi-level testing and documentation.
- Providing a wide range of user services, including technical support and training, to facilitate the continued adoption of ROS-Industrial by industry.

- Providing a mechanism for formal marketing and distribution of the code to a wider audience, thereby further expanding the user community, and providing greater capabilities.

Organization Structure

The RIC is organized to ensure members have the opportunity to provide technical and programmatic direction. Members will enjoy benefits as outlined in the table presented in the Membership section below. There are three primary elements of structure:

Consortium Advisory Committee (CAC): An Advisory Committee serves the role of facilitating Full Member interactions, program review, and setting technical direction. The CAC shall be composed of one (1) representative from each Full Member company in good standing, plus one (1) representative from SwRI.

Chairman: The Consortium manager shall normally act as Chairman of any CAC meeting. At the request of any Full Member representative, or at SwRI's option, another Participant may be requested to act as Chairman. In such a case, the Participants shall appoint a chairman of the CAC for that meeting from among the Full Member representatives present.

Consortium Manager: SwRI will appoint a Consortium Manager who will have the primary responsibility to ensure that the voices of the consortium participants are heard by the ROS-Industrial development team. SwRI will appoint a RIC manager who will coordinate member needs with the "big picture" of ROS-Industrial for the benefit of all concerned. This communications process will include workshops with presentations by the ROS-Industrial developers and Consortium participants, along with open discussions among the entire Consortium.

Focused Technical Projects

Full Members may initiate collaborative Focused Technical Projects (FTPs) to develop tools and application-specific software capabilities that are of common interest to multiple members. Timing for project start/end will be ad-hoc. FTPs will default to completely open source software, but sponsoring members may choose to hold the application-specific data, technical reports, and IP within the FTP team for a period of up to two years, with the consent of the majority of the sponsoring members. Upon identification of an FTP, SwRI will prepare a scope and cost estimate for review by potential sponsors. In-kind contributions will be considered as part of the delivered scope by the team members and left out of the cost portion of the proposal. Upon approval, the sponsoring members will split the FTP cost equally. New members, or Full Members wishing to sponsor an FTP after the start-date, will pay the same amount as the founding sponsors, resulting in additional scope for that particular FTP.

Membership

Members in good standing will enjoy the opportunity to participate based on membership levels. Membership dues will first go toward the operations of the RIC. Funds from membership dues that are above the operations budget will be allocated toward broadly useful tools, technical work, and standards activities as prioritized and voted upon by the CAC. The RIC is actively seeking broad participation from users, robot manufacturers, integrators, researchers, and government participants.

Level	Benefits/Participation Opportunities	Funding Level
Full Member	<ul style="list-style-type: none"> • Seat on the Consortium Advisory Committee • Set priorities for membership-fee-funded research • Eligible to sponsor and participate in Focused Technical Projects • Access to project data and technical reports arising from consortium's Focused Technical Projects • Live technical support • All benefits of Associate Membership 	\$11,000
Associate Member	<ul style="list-style-type: none"> • Attendance at all events • ROS-I Training • Provide input to ROS-I roadmap • Networking 	\$5,500
Research Member (University/Non-profit R&D)	<ul style="list-style-type: none"> • Attendance at all events • ROS-I Training • Provide input to ROS-I roadmap • Networking • Opportunity to present related research 	\$2,500
Start-Up (Smaller than 40 Tech Staff, Less than 4 years in age)	<ul style="list-style-type: none"> • Attendance at all events • ROS-I Training • Provide input to ROS-I roadmap • Networking • Opportunity to present related research 	\$2,500
Government Member	<ul style="list-style-type: none"> • Attendance at all events • Provide input to ROS-I roadmap 	\$0

More Information

ROS-Industrial Consortium: <https://rosindustrial.org/ric-americas/join-now/>

ROS-Industrial: <http://ros-i.org>

Training: rosindustrial.org/training

Software Repository: <https://github.com/ros-industrial>

Email / Call: matt.robinson@swri.org / 210.522.5823

COOPERATIVE INDUSTRY PROJECT AGREEMENT

_____, a corporation having its place of business at _____, a “Participant” in and for purposes of this Agreement only, which together with other participants will be referred to as “ROS-Industrial Consortium”, sometimes herein called the “Consortium”, hereby agrees with SOUTHWEST RESEARCH INSTITUTE® (SwRI®), a Texas nonprofit corporation, having its principal offices at 6220 Culebra Road, San Antonio, Texas, 78238, herein called “SwRI”, to participate in the activities of the Consortium and potentially fund focused projects that will have as their major goal to enable industrial software developers to build more capable robot applications quickly and easily on a common platform, the Robot Operating System - Industrial (ROS Industrial) open source software program.

ARTICLE I Consortium Mission

The mission of the Consortium is to accelerate the development of ROS-Industrial by:

- (a) Establishing a roadmap to identify and prioritize ROS-Industrial capabilities for industrial robotics and automation as defined by the user community to address its current and future applications problems.
- (b) Instituting and enforcing code quality standards appropriate for an industrial software product. These include rating/tracking code quality metrics, multi-level testing and documentation.
- (c) Providing a wide range of user services, including technical support and training, to facilitate the continued adoption of ROS-Industrial by industry.

- (d) Providing a mechanism for formal marketing and distribution of the code to a wider audience, thereby further expanding the user community, and providing greater capabilities.

ARTICLE II Consortium Organization Structure

The Consortium is organized to ensure members have the opportunity to provide technical and programmatic direction. Members will enjoy benefits as outlined in the table presented in Article III below. There are three primary elements of structure:

- (a) **Consortium Advisory Committee (CAC):** The CAC serves the role of facilitating Full Member interactions, program review, and setting technical direction. The CAC shall be composed of one (1) representative from each Full Member company in good standing, plus one (1) representative from SwRI.
- (b) **Chairman:** The Consortium Manager shall normally act as Chairman of any CAC meeting. At the request of any Full Member representative, or at SwRI's option, another Full Member may be requested to act as Chairman. In such a case, the Full Members shall appoint a chairman of the CAC for that meeting from among the Full Member representatives present.
- (c) **Consortium Manager:** SwRI will appoint a Consortium Manager who will have the primary responsibility to ensure that the voices of all Consortium Participants are heard by the ROS-Industrial development team and who will coordinate member needs with the "big picture" of ROS-Industrial for the benefit of all concerned. This communications process will include workshops with presentations by the ROS-Industrial developers and Consortium participants, along with open discussions among the entire Consortium.

ARTICLE III
Consortium Membership, Good Standing and Start-Up

Members in good standing will enjoy the opportunity to participate based on membership levels. Membership dues will first go toward the operations and administration of the Consortium. Funds from membership dues that are above the operations and administration budget will be allocated toward broadly useful tools, technical work, and standards activities as prioritized and voted upon by the CAC. The Consortium is actively seeking broad participation from users, robot manufacturers, integrators, researchers, and government participants.

Level	Benefits/Participation Opportunities	Funding Level	Select Level <input checked="" type="checkbox"/>
Full Member	<ul style="list-style-type: none"> • Seat on the Consortium Advisory Committee • Set priorities for membership-fee-funded research • Eligible to sponsor and participate in Focused Technical Projects • Access to project data and technical reports arising from consortium's Focused Technical Projects • Attendance at all events • ROS-I Training • Provide input to ROS-I roadmap • Networking 	\$11,000	<input type="checkbox"/>
Associate Member	<ul style="list-style-type: none"> • Attendance at all events • ROS-I Training • Provide input to ROS-I roadmap • Networking 	\$5,500	<input type="checkbox"/>
Research Member (University/Non-profit R&D)	<ul style="list-style-type: none"> • Attendance at all events • ROS-I Training • Provide input to ROS-I roadmap • Networking • Opportunity to present related research 	\$2,500	<input type="checkbox"/>
Start-Up (Smaller than 40 Tech Staff, Less than 4 years in age)	<ul style="list-style-type: none"> • Attendance at all events • ROS-I Training • Provide input to ROS-I roadmap • Networking • Opportunity to present related research 	\$2,500	<input type="checkbox"/>
Government Member	<ul style="list-style-type: none"> • Attendance at all events • Provide input to ROS-I roadmap 	\$0	<input type="checkbox"/>

Participant shall make an initial payment to SwRI equal to the Consortium annual membership fee based on its category (or higher category, if so elected) upon execution of the Agreement, and to continue its membership annually thereafter at the membership fee based on its category; first-time membership dues shall be prorated based on the number of months remaining in the Consortium year. In-kind contributions toward membership fees will not be allowed at any level.

A Participant shall be in good standing if the Participant has paid the initial annual membership fee, subsequent annual membership fees, and, if a sponsoring Full Member for an Focused Technical Project (FTP), its share of the FTP cost within the time specified in each invoice.

Start-up of the Consortium will occur once Participants have funded \$75,000 in membership fees but in no event earlier than January 1, 2013. If funding of membership fees has not reached \$75,000 by January 1, 2013, SwRI may elect to abandon establishing the Consortium by refunding all membership fees then paid.

In addition to these Memberships, Full Members of this Consortium may apply for a Consortium Dual Membership to join the RIC-Europe at Associate level without additional costs. Likewise, Full Members of RIC-Europe may apply for a Consortium Dual Membership to join this Consortium at associate level without additional costs. All benefits for the associate level apply with the exception of support and training. By invitation of the Full Members sponsoring an FTP, FTP participation rights may be granted to RIC-Europe Associate Member equal to the sponsoring Full Members.

If a Member pays for training, such payment(s) shall be counted toward the payment of the Members' annual membership fee for the current Consortium year. If training payments by the Member exceed the Member's annual membership fee due for the current year, the surplus shall be retained by the Consortium. If the training payments are less than the Members' annual membership fee for the current Consortium year, the remaining balance shall be paid by the Member before payment for the Member's annual membership fee for the next year.

For purposes of this Article III only, “Affiliate” shall mean a parent or sibling business defined as: Participant and any successor in interest, a) any Business which at the time in question Controls Participant (“Parent”), b) or any Business which Participant or Parent at the time in question directly or indirectly Controls. “Business” means any corporation, partnership, limited liability company, association, venture, or other form of entity. “Control” means the direct or indirect ownership of holding of stock, shares, interests, indicia of equity, or voting or other rights entitled (i) to vote for the election of at least fifty percent (50%) of the directors of the Business and/or (ii) to establish, direct or command management of the Business.

At any time and from time to time Participant may elect to nominate a maximum of two Affiliates to be a participant in the Consortium at the same participation level as Participant. Each nominated Affiliate agrees to be bound by the terms and conditions of this Cooperative Industry Project Agreement and shall have all the same rights as the Participant; provided that, if Participant is a Full Member of the Consortium, a) for purposes of voting on matters coming before the CAC, Participant and its nominated Affiliates shall have a single vote, and b) for purposes of joining as a new member of an existing FTP, the existing members of the FTP will determine the entrance requirements for the Affiliate other than the FTP cost to enter.

The Affiliates’ participation rights shall become effective immediately upon Participant notifying the Consortium Manager of the name, representative’s name, entity type and address of each nominated Affiliate.

Participant shall be permitted to change or substitute nominated Affiliates one time during each year of the Consortium.

ARTICLE IV CONSORTIUM FOCUSED TECHNICAL PROJECTS

Full Members may initiate collaborative FTPs with SwRI to develop tools and application-specific software capabilities that are of common interest to multiple members. Timing for project start/end will be ad-hoc. FTPs will default to completely open source software, but sponsoring Full

Members may choose to hold the application-specific data, technical reports, and any developed intellectual property within the FTP team for a period of up to two years, with the consent of the majority of the sponsoring Full Members. Upon identification of an FTP, SwRI will prepare a scope and cost estimate for review by potential sponsors. Upon approval, evidenced by the signature of each sponsoring Full Member, the sponsoring Full Members will split SwRI's cost of performing the FTP equally. New members, or Full Members wishing to sponsor an FTP after the start-date, will pay the same amount as the founding sponsors, resulting in additional scope for that particular FTP.

In-kind hardware contributions can be accepted for an FTP if it is relevant to the scope of work and all sponsoring Full Members agree to accept the in-kind hardware contribution toward the contributing Members cost share of the FTP. Any in-kind contributions of benchmark data, algorithms or software code by a sponsoring Member to an FTP shall be determined at the proposal stage and agreed by all sponsoring Members of the FTP. The in-kind contribution of the Member shall be described with all technical requirements and specifications as a deliverable from the contributing Member for the FTP, will result in reduction in the costs of the preliminary proposal for the FTP and will result in a reduction in the cost to be paid by the contributing Member. SwRI shall be responsible for the assessment as to whether the in-kind contribution meets the deliverable requirements and specifications and for any direction to the Member to re-work or correct any found deficiencies.

ARTICLE V

Invoices and Payments

All invoices rendered by SwRI for the Project shall be paid within twenty (20) days from date of invoice.

All payments by Participant to SwRI shall be made in United States of America ("United States") currency.

All payments to SwRI shall be free and clear of all taxes and other governmental charges of any country except the United States. In the event taxes or other governmental charges are levied by

any country except the United States, Participant shall pay the same, and such taxes or other governmental charges shall not be deducted from the payments to SwRI.

ARTICLE VI Records

SwRI shall keep adequate books, records, and other documentation to support invoices sent to Participants for membership and FTP services. For any FTP's that may be conducted on a time-and-material or cost reimbursement basis, each sponsoring Full Member in good standing, or its duly authorized representative, shall have access at all reasonable times during SwRI's regular working hours during the performance of each FTP and for a period of two (2) years after termination thereof, to SwRI's books, records and all other documentation pertaining to the particular FTP for the purpose of auditing and verifying the charges made to the sponsoring Full Member for work related to that FTP. Such access shall include the right to discuss such books, records, and other documentation with appropriate SwRI personnel and shall also include the right to make copies of that portion, but only that portion, of such books, records, and other documentation as relates exclusively to the FTP. Each sponsoring Full Member shall have such access only after reasonable notice to SwRI. SwRI will preserve all such books, records and other documents mentioned above for a period of not less than two (2) years following completion of a particular FTP. For the absence of doubt, sponsoring Full Members shall not have audit access to any records of an FTP performed on a fixed price or lump sum basis.

ARTICLE VII Reports

Each quarter during which the work on an FTP progresses, SwRI shall report in writing to each sponsoring Full Member in good standing information relating to the FTP. Upon completion of the FTP, SwRI shall prepare a final report for dissemination to each sponsoring Full Member in good standing.

ARTICLE VIII
Confidentiality and Nondisclosure

For a period of five (5) years following the date of the disclosure to it by a Participant, SwRI shall not publish or disclose to others, including other Participants without such Participant's prior written approval, any information which it learns from, or which is disclosed to it by reason of its work on the Project and which is proprietary and confidential to such Participant, and is so identified in writing at the time of disclosure. This obligation of nonpublication and nondisclosure shall not apply to any item of such information which:

- (a) was available to the public by publication or otherwise, or was a part of the public domain at the time such information became known to SwRI; or
- (b) becomes available to the public by publication or otherwise or becomes a part of the public domain through no fault of SwRI after such information becomes known to SwRI; or
- (c) is or has been disclosed to a third party without the same or substantially the same obligations of nonpublication and nondisclosure as those imposed on SwRI hereby; or
- (d) was known to SwRI independently from the Project at the time it was disclosed to SwRI; or
- (e) is disclosed by SwRI as the result of a lawful government judicial, legislative or executive subpoena, order or decree properly issued and served on SwRI by an authority having jurisdiction thereof. In the event of such service, or notice thereof, SwRI shall promptly notify the affected Participant(s) and shall afford such Participant(s) all reasonable cooperation to the end that the proprietary and confidential nature thereof may be protected.

ARTICLE IX
Open Source Software

During the term that work on an FTP is being performed, SwRI and the Consortium will release additions to the ROS-Industrial software as open-source software under the business friendly BSD license structure. A description of the BSD open source license may be accessed at <http://www.opensource.org/license/BSD-3-Clause>. Open source release will benefit the Participants of the Consortium by engaging a broader community to test, debug and extend the work of the FTPs and the Consortium without additional cost to the Participants and thereby leveraging Participant investment in the Consortium.

ARTICLE X
Data Use

Data generated during the term of each FTP will be released periodically by SwRI to the Participants. Neither SwRI nor Participant shall publish or disclose to others, test results, data, recommendations and analysis, or any other information contained in the data releases or reports prepared for the Participants as determined by the majority of the sponsoring Full Members of the FTP. Any such restriction shall not preclude the Participant from using such information in the normal conduct of its business, provided any third party receiving such information will be bound by the same restrictions as the Participant is bound to this Agreement. Information in the reports can be disclosed to third parties without a restriction of confidentiality during this period only after receiving the approval of a majority of the sponsoring Full Members of the FTP. With respect to copies of reports to be delivered to any Participant who is a government entity, SwRI shall edit out and not disclose any confidential or proprietary information of any other Participant, if any.

ARTICLE XI
Collaborations and Communications

It is the current intent of SwRI that the ROS-Industrial Consortium enter into arrangements by collaboration agreement or memorandum of understanding with other consortia or entities interested

in furthering research and development of the ROS –Industrial open source software, hereinafter referred to as “ROS Related Parties”. SwRI proposes that the arrangements between the ROS-Industrial Consortium and ROS Related Parties be established to collaborate on mutually agreed ROS-Industrial open source software technical and development topics and to agree on projects to be conducted separately by each to provide the best value to the ROS-Industrial Consortium, its members and the ROS Related Entity; to strive to maximize economic achievement of mutual interests and goals; and to avoid wasteful duplication of effort wherever possible, including the development of software with duplicative functionality. In order to achieve these goals, the collaboration agreement with the ROS Related Entity and, if a consortium, the underlying member agreements, must provide, among other mutually beneficial terms and conditions, for the communication and sharing of information similar to that developed under this Agreement and the mandatory compliance with non-disclosure restrictions set forth in Articles VII and X. By executing this Agreement, Participant is agreeing to the proposed collaborations, their goals and the described sharing of information developed under this Agreement in the framework described and authorizing SwRI to negotiate and execute a collaboration agreement between the ROS – Industrial Consortium and any ROS Related Parties on reasonable terms and conditions to achieve these arrangements.

ARTICLE XII

Advertising and Report Usage

No advertising or publicity having or containing any reference, either directly or by implication, to SwRI or any of its employees, agents or consultants, shall be made use of by any Participant or on its behalf unless the same first shall have been approved in writing by an authorized officer of SwRI. In the event any Participant shall distribute or use any report on an FTP issued by SwRI outside its own organization, in addition to restrictions imposed by Article X herein, such report shall be used in its entirety, unless an authorized officer of SwRI shall first approve in writing a summary or abridgement of the same for such distribution or use. It is understood and agreed that the restrictions of this Article shall not preclude any Participant in good standing from making use of the

final report prepared by SwRI at the close of the FTP, but only in its entirety, for the purpose of securing acceptance or approval of the subject matter of the FTP by any duly constituted governmental authority having jurisdiction thereof, or by any generally recognized or accredited standardizing committee or organization. The obligations of this Article shall survive the termination of this Agreement whether such termination is by its terms or for cause. No advertising or publicity containing reference to the association of the Participants in the Consortium or the sponsoring Full Members of a FTP , shall be made use of by any Participant. Each Participant agrees that SwRI may use its name and logo in any communications, publicity or announcements concerning the membership and operation of the Consortium.

ARTICLE XIII **Patentable Intellectual Property**

SwRI does not anticipate that there will be patentable intellectual property developed during the term of the Consortium and SwRI will not seek to protect by patent any software that will be released as open source software. However, in the event that other patentable intellectual property is developed by SwRI, the following shall apply:

- (a) SwRI represents that each of its employees assigned to work on each FTP will have entered into an employment contract with SwRI which provides for the assignment to SwRI of all inventions of such employees which come within the terms of this Agreement.
- (b) SwRI agrees that if, during the time this Agreement is in effect, any of its employees, while working on an FTP and as a result thereof, shall make an invention which relates exclusively thereto, SwRI shall promptly make such invention known to each Participant.
- (c) SwRI agrees that it will make application for United States Letters Patent on any such invention falling within the terms of Article XIII(b) above upon the request of any Participant, provided that there is established at SwRI an initial prepaid appropriation

for such patent application and prosecution in an amount to be mutually agreed upon by SwRI and those Participants who wish to obtain licenses under any patent issuing on such application, and provided that all of the costs incurred by SwRI in connection with such application and prosecution and maintenance over and above such prepaid appropriation have been paid by such Participants. SwRI shall retain title to such application and any patent issuing thereon. If a Participant has contributed its full share to all costs of such patent application, prosecution, and maintenance, SwRI shall issue to it and to its subsidiaries a royalty-free, irrevocable (except as otherwise provided below), non-assignable, nonexclusive license to make, have made for it, use, lease, and sell such invention under any such application or patent issued on such application provided that the foregoing shall not be deemed to imply an obligation of nonuse on any Participant in respect to the particular item of technical information or data contained in any such patent application. Each such license shall remain in effect as long as the licensee contributes its full share of all costs required for continuing maintenance of any such application and patent. In the event that at any time the payments to SwRI hereunder are not sufficient to cover all the costs of maintaining any such application or patent, SwRI may abandon the same forthwith and thereafter SwRI shall be under no further obligation with respect thereto or in its discretion continue to maintain any such applications or patents at SwRI's sole expense and in that event SwRI shall retain all rights of ownership and is released of any obligations to Participant for future licensing of the application or patent.

- (d) Upon the request of any Participant(s) in good standing, SwRI shall make application or applications for Letters Patent in the countries specified by the requesting Participant outside the United States on any such invention falling within the terms of Article XIII(b) above, provided that there is established by the requesting Participant(s) an

initial prepaid appropriation for such patent application, prosecution and maintenance in an amount to be mutually agreed upon by SwRI and the requesting Participant(s) who wishes to obtain a license under any patent issuing on such application or applications and provided that all of the costs incurred by SwRI in connection with any such application, prosecution and maintenance over and above such prepaid appropriation have been paid by such Participant(s). SwRI shall retain title to such applications and any patents issuing thereon. If any Participant has contributed its full share of all costs of such patent application, prosecution and maintenance, SwRI shall issue to it and to its subsidiaries a royalty-free, irrevocable (except as otherwise provided below), non-assignable, nonexclusive license to make, have made for it, use, lease, and sell such invention under any such application or patent issued on such application. Each such license shall remain in effect as long as the licensee contributes its full share of all costs required for continuing maintenance of any such application and patent. In the event that at any time the payments to SwRI hereunder are not sufficient to cover all the costs of maintaining any such application or patent, SwRI may abandon the same forthwith and thereafter SwRI shall be under no further obligation with respect thereto or in its discretion continue to maintain any such applications or patents at the SwRI's sole expense and in that event SwRI shall retain all rights of ownership and is released of any obligations to Participant for future licensing of the application or patent.

- (e) For purposes of this Agreement, a subsidiary of a Participant shall be any United States or foreign corporation in which such Participant owns or controls more than fifty percent (50%) of the stock entitled to vote for the election of directors.
- (f) If SwRI has any dominant and relevant background patent or data rights and it determines such rights to be needed for full utilization of foreground data, inventions

or discoveries developed under this Agreement, SwRI agrees to make available to each Participant such background rights.

**ARTICLE XIV
Governing Law**

This Agreement shall be construed and the legal relationships between the parties determined in accordance with the laws of the State of Texas.

**ARTICLE XV
Independent Contractor**

SwRI is not and shall not act or purport to act as an employee, agent, or representative of the Participants, but is and shall act as an independent contractor. The Participants shall not exercise any control over or direction of the manner in which SwRI performs any of its operations under this Agreement.

**ARTICLE XVI
New Participants**

At any time after initiation of the Project, additional organizations may become Participants, provided that each new Participant shall pay to SwRI the appropriate Consortium annual membership fee for the Project year in question and remain a Participant in good standing thereafter.

**ARTICLE XVII
Consortium Advisory Committee**

A Consortium Advisory Committee (“CAC”) shall be formed and maintained for the purpose of providing appropriate liaison, review and recommendations related to the Consortium. The CAC shall be composed of one (1) representative from each of the Full Members in good standing, plus one (1) representative from SwRI. The CAC shall meet and have the rights and responsibilities as set forth in Appendix 1 attached hereto and incorporated by reference.

ARTICLE XVIII
Arbitration of Disputes

Any and all disputes arising in connection with this Agreement which cannot be settled by negotiation between the parties hereto shall at the request of either or both parties be referred to and finally settled under the then-prevailing rules of the American Arbitration Association by one (1) or more arbitrators appointed in accordance with said Rules. Notwithstanding any provisions of the Rules of the American Arbitration Association of any applicable state or federal law, the parties agree that the Arbitrators cannot award exemplary or punitive damages. Judgment upon the award rendered may be entered in any court having jurisdiction, or application may be made to the court for judicial acceptance of the award and an order of enforcement as the case may be. All arbitration proceedings shall take place in San Antonio, Texas.

ARTICLE XIX
Insurance

At all times during the performance of services hereunder, SwRI shall carry and maintain in force Workers' Compensation and Employers' Liability Insurance in accordance with the law which may be applicable to all of its employees engaged in performing the work. SwRI further agrees to carry and maintain in force Commercial General and Automobile Liability Insurance. Upon request SwRI shall have its insurance carrier(s) furnish to Participant certificates of insurance specifying the policy limits. Every such contract of insurance shall provide that the same may not be materially changed or canceled without the insurance carrier(s') endeavoring to provide the Participants through SwRI thirty (30) days prior written notice thereof.

ARTICLE XX
Warranty and Disclaimers

SwRI warrants that it will perform the services under this Contract with the degree of high professional skill and sound practices and judgment which is normally exercised by recognized professional firms with respect to services of a similar nature.

However, neither SwRI nor anyone acting on its behalf:

- (a) MAKES ANY WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, WITH RESPECT TO THE ACCURACY, COMPLETENESS, USEFULNESS OR RELIABILITY OF DATA OR OTHER INFORMATION FURNISHED TO IT BY ANY THIRD PARTY; OR
- (b) ASSUMES ANY LIABILITY FOR DIRECT, FORESEEABLE OR CONSEQUENTIAL LOSS, COST OR DAMAGE RESULTING FROM DEATH, PERSONAL INJURIES, LOSS OR DAMAGE TO PROPERTY, OR IMPAIRMENT OR DAMAGE TO ANY RIGHT, INCLUDING, BUT NOT BY WAY OF LIMITATION, THE RIGHT TO BE PAID FOR LOSS OF TIME, LOSS OF SERVICES, OR ATTORNEYS' FEES AND OTHER EXPENSES INCURRED, ARISING OUT OF OR AS A CONSEQUENCE OF THE SERVICES PERFORMED OR THE USE OR MISUSE OF ANY DATA OR OTHER INFORMATION RESULTING FROM THE SERVICES PERFORMED UNDER THIS AGREEMENT.

ARTICLE XXI
Federal Notifications

Participant hereby authorizes SwRI to notify the United States Department of Justice and the Federal Trade Commission of this cooperative arrangement and its Participants and to review on its behalf the notice, which is to be published in the Federal Register pursuant to the National Cooperative Research and Production Act (15 USC 4301).

ARTICLE XXII
Export Compliance

United States export control laws and regulations apply to this Contract and SwRI will comply with such laws and regulations in the performance of the Contract. Participant expressly assures SwRI that neither unpublished technical data nor any hardware involved in this transaction furnished by SwRI to Participant, and no direct product thereof, will be furnished or made available by Participant to any third party except in accordance with the applicable laws and regulations of the United States then in force.

ARTICLE XXIII
Integration

This Agreement embodies the entire agreement between the parties with respect to the subject matter hereof and all previous oral or written negotiations, representations, agreements and understandings are merged into, extinguished by and completely expressed by it.

EXECUTED on behalf of each of the parties hereto by its authorized officer or officers respectively on the date indicated.

ARTICLE XXIV
Electronic Signatures

Either party may execute this contract and any additional documents including, but not limited to, modifications, and representations and certifications related to this contract by facsimile or electronic signature. The other party shall be entitled to rely on such facsimile or electronic signature as evidence that this contract has been duly executed by an authorized representative. Further, neither party shall contest the validity of this contract based on the use of facsimile or electronic signatures.

SOUTHWEST RESEARCH INSTITUTE

By: _____

Name: W. Troy Nagy

Title: Director, Contracts

Date: May 1, 2018

(CLIENT'S NAME)

By: _____

Name: _____

Title: _____

Date: _____