

UNIVERSITY RESEARCH PROGRAM

The Raymond Corporation, a Toyota Industries Company

OVERVIEW

The Raymond Corporation, a Toyota Industries Company, is making research funding available in the fields of material handling through its University Research Program. Raymond is seeking proposals for academic research that drives new technology or innovative approaches to the material handling industry.

Selected proposals will receive financial support of up to \$500,000 per year. It is anticipated that multiple proposals will receive financial support. Faculty that receive financial support through the University Research Program (URP) may be invited to renew the contract for up to three years based on the research outcomes.

2022-2023 TIMELINE:

PROPOSAL SUBMISSIONS OPEN

Monday, April 12, 2021

CONCEPT REVIEW DEADLINE

Friday, August 27, 2021

PROPOSAL DEADLINE

Friday, November 5, 2021

ANNOUNCEMENT OF SELECTED PROPOSALS

Monday, March 28, 2022

Finalists will be contacted by a representative from The Raymond Corporation. At that time, a research project liaison will be assigned by The Raymond Corporation. The liaison will serve as the point of contact for duration of the project.

UNIVERSITY RESEARCH PROGRAM RESEARCH THEMES

The Future of Logistics

1. Material handling in an uncertain future | How should industry prepare for future supply chain disruptions?
2. Material handling in a "smart city" | What equipment and distribution facilities are needed to support smart cities?
3. Warehouse design | What equipment is needed for a revolutionary new facility that combines retail, e-commerce, inventory storage and reverse logistics and what does the facility look like?
4. Urban and suburban package delivery | How could goods be configured just before delivery?

Improving Material Handling

5. Automation and material handling | What hardware and software can ease the transition to automation?
6. Advanced sensors for material handling | What new technology can be used for indoor location tracking, measuring wear or monitoring ergonomics?
7. Advanced vision systems and material handling | How could productivity be improved with vision systems enabled by lower cost, higher performing computers?

Truck and Operation Evolution

8. Industrial design of vehicles | What new materials and processes can improve the design, manufacturability and sustainability of material handling vehicles?
9. Operator ergonomics | How can digital twins and human factors improve operator productivity?
10. Neurotechnology applications in material handling | How could operator productivity improve with a direct connection to the human brain or an indirect haptic connection?

CONFIDENTIAL AND PROPRIETARY INFORMATION

Participants shall ensure that no confidential or proprietary information is included in submitted proposals. The Raymond Corporation will treat all information submitted in proposals as non-confidential and non-proprietary. The nature of the URP requires that submitted proposals be reviewed by The Raymond Corporation personnel, including The Raymond Corporation researchers, who will become knowledgeable of the information provided by the university researcher in the project proposal. During the evaluation process, The Raymond Corporation cannot maintain the confidentiality of information set forth in the proposals. Accordingly, The Raymond Corporation does not require, and does not desire, to receive any information that may be deemed confidential by the university researcher or the university.

EVALUATION CRITERIA

Through the URP, The Raymond Corporation hopes to establish relationships with leading universities and researchers to conduct innovative research that will advance material handling and contribute to The Raymond Corporation's future research activities.

Funding selection of URP proposals shall be at the sole discretion of The Raymond Corporation. The following criteria are the primary criteria that will be used to evaluate URP proposals:

- Research must contribute to the field of material handling.
- Research must be significant, innovative and have a positive impact on the future of material handling.
- Research effort must be well planned and feasible within the time period specified and budget requested.
- Researchers and principal investigators must be qualified in the proposed field of research.

REQUIRED DOCUMENTS

Each research proposal package shall include the following three documents and shall be delivered electronically to University ResearchProgram@raymondcorp.com

1. Research proposal package in PDF format.
2. Scanned PDF copy of an unmodified URP Proposal Confirmation Letter signed by an authorized university official.

If submitting a joint proposal with other universities, each university included in the proposal must sign the URP Proposal Confirmation Letter.

UNIVERSITY RESEARCH PROGRAM PROPOSAL FORMAT

Applicants are expected to provide the following information with each URP proposal. It is recommended that the research proposal (item 3 below) be limited to 10 pages. Items 1, 2, 4 & 5 are not included in the 10 page count.

1. The Raymond Corporation URP proposal cover page including the proposal title, the name and university affiliation of the principal investigator along with any co-PIs
2. One page executive abstract with key words. If applicable, the abstract should indicate if the proposal could be a multi-year effort. The project description, however, should focus on year one objectives.
3. A research proposal (up to 10 pages) that:
 - a. Clearly states the research opportunity and objectives.
 - b. Explains why the research is innovative.
 - c. Proposes the anticipated significance of the research.
 - d. Provides a research plan and technical approach.
 - e. Identifies milestones that measure the success of the project.
 - f. Defines the expected outcomes.
 - g. Does not contain confidential or proprietary information.
4. Detailed budget in US dollars that clearly identifies the funding requested.
5. Additional supporting materials such as curricula vitae of principal investigators and other researchers is to be included in the appendix.

If you intend to submit a multi-year proposal, please indicate this in item 2. The budget (item 4 above) shall be completed on a one year proposal basis only. In order to receive funding for subsequent years, applicants must reapply with an updated proposal.

RAYMOND

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